PIONEER
The Art of Entertainment

Service Manual

• DEH-M980RDS/EW

ORDER NO.
CRT1450

MULTI-CD CONTROL HIGH POWER COMPACT DISC PLAYER WITH FM/AM TUNER

DEH-M980 UC
DEH-M77 US
DEH-M940 ES

MULTI-CD CONTROL HIGH POWER COMPACT DISC PLAYER WITH RDS TUNER

DEH-M980RDS EW, X1B

COMPACT disc DIGITAL AUDIO

CONTENTS

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FS JAN. 1992 Printed in Japan

- **CD Player Service Precautions**

1. For pickup unit (CGY1020) handling, please refer to "Disassembly" (Fig.8) During replacement, handling precautions shall be taken to prevent an electrostatic discharge (protection by a short pin).
2. During disassembly,be sure to turn the power off since an internal IC might be destroyed when a connector is plugged or unplugged.

SAFETY INFORMATION (UC, US MODEL)

CAUTION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5). When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

SAFETY INFORMATION (EW MODEL)

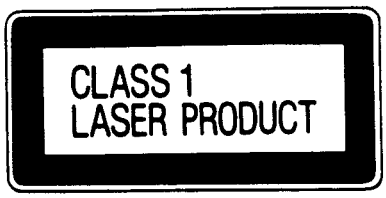
1. Safety Precautions for those who Service this Unit.

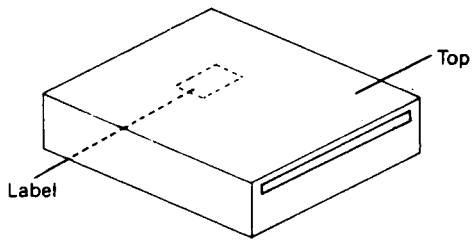
- Follow the adjustment steps(see pages 20 through 39) in the service manual when servicing this unit. When checking or adjusting the emitting power of the laser diode exercise caution in order to get safe, reliable results.

Caution:

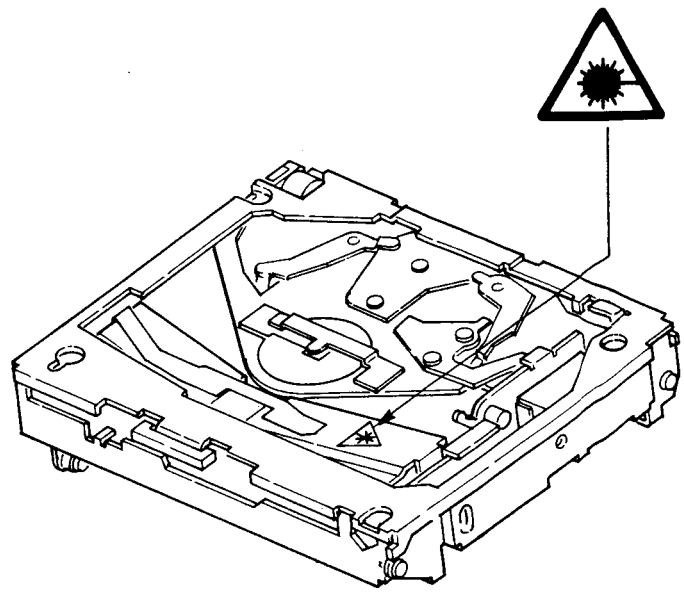
1. During repair or tests, minimum distance of 13cm from the focus lens must be kept.
2. During repair or tests, do not view laser beam for 10 seconds or longer.

2. A "CLASS 1 LASER PRODUCT" label is affixed to the bottom of the player.





3. The triangular label is attached to the mechanism unit arm unit.



4. Specifications of Laser Diode

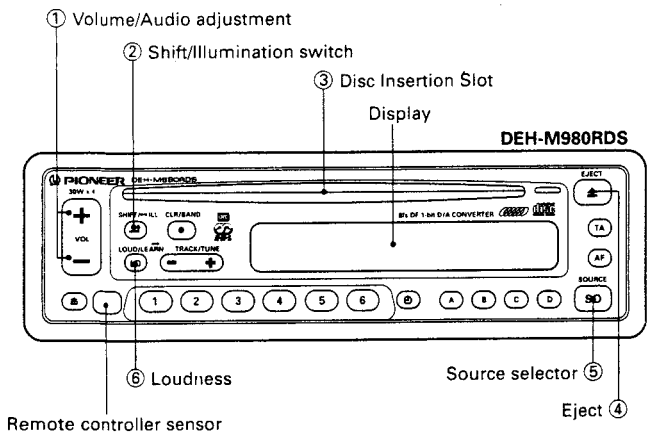
Specifications of laser radiation fields to which human access is possible during service.

Wavelength = 785 nanometers

Radiant power = 69.7 microwatts
(Through a circular aperture stop having a diameter of 80 millimeters)

0.55 microwatts
(Through a circular aperture stop having a diameter of 7 millimeters)

1. ADJUSTING VOLUME AND TONE



Switching Power On

Tuner

Press button ⑤ to switch the tuner power on. Press button ⑤ again to switch the power off.

CD Player

When a disc is inserted half-way into the disc insertion slot ③ with its label side upward, the disc is automatically loaded and played. To remove the disc, push button ④.

Changing the source

To change the source, push button ⑤ with the disc inserted in the slot.
At each press of the button, the source changes as follows: CD player — Tuner — OFF.
When a separately sold multi play CD player is connected to DEH-M980RDS.
Pushing button ⑤ while a disc is inserted changes the source as follows: CD Player — Multi Play CD Player — Tuner — OFF.

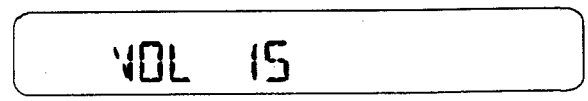
- The source will not change to the multi play CD player when a magazine is not set.

Adjusting Audio

Press button ① to adjust the volume. Each press of button ② changes the display and the function of button ① as follows:
Volume —Fader — Bass— Middle —Treble — Balance

Adjusting Volume

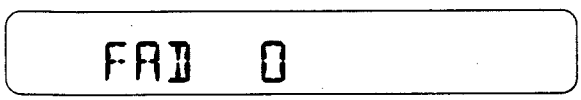
Pressing the (+) side of button ① increases the volume, while the (–) side decreases it.



Adjusting the Fader

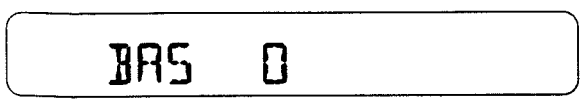
Balancing the sound volume between the front and rear speakers. Gradually transfer the sound to the front speaker by holding down the (+) side of button ①. Gradually transfer the sound to the rear speaker by holding down the (–) side of button ①.

- Please set FAD at 0 when using a two-speaker system.



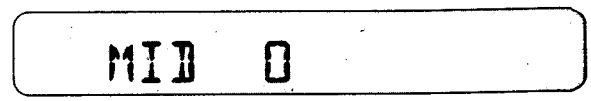
Adjusting Bass

Pressing the (+) side of button ① increases bass, while the (–) side decreases bass.



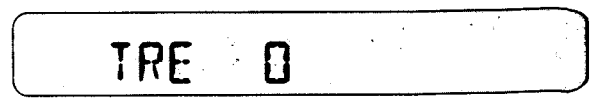
Adjusting Middle

Pressing the (+) side of button ① increases middle, while the (–) side decreases middle.



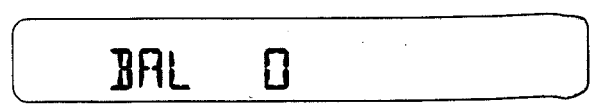
Adjusting Treble

Pressing the (+) side of button ① increases treble, while the (–) side decreases treble.



Adjusting Balance

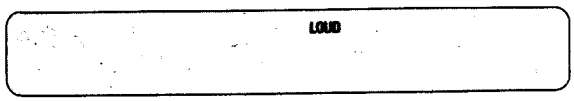
Pressing (+) side of button ① shifts the balance to the left speaker, while the (–) side shifts it to the right speaker.



- When you're adjusting fader, bass, middle, treble, or balance settings, the indicator will stop at the center setting. About 5 seconds after adjustment has been made, the display returns to its previous state.

Using the Loudness Function

Press button ⑥ and the LOUD indicator will appear on the display. This "loudness" function enhances both the high and low ranges of sound to give even more power to output even at low volumes.

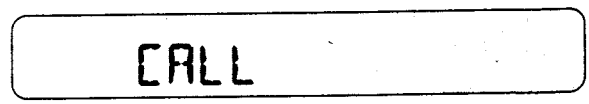


Switching Illumination Colour

Pressing button ② for more than 2 seconds causes the illumination color to switch between green and amber.

Regarding the Cellular Telephone Muting

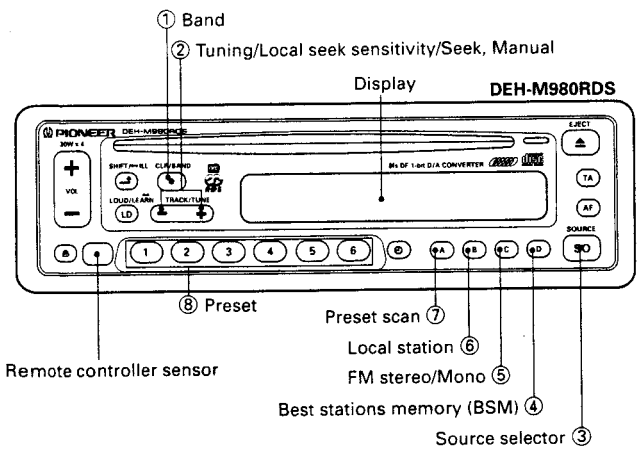
When the audio mute terminal of a separately sold PIONEER cellular telephone is connected to the cellular mute terminal of the unit, the following function becomes active.
When a phone call is received or made on the cellular telephone, the volume is automatically lowered by the unit, and CALL is shown on the display.

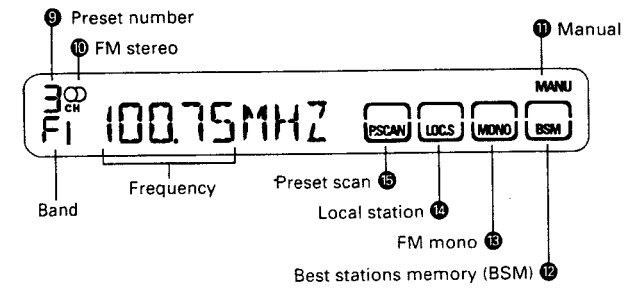


When a call is ended, the volume returns to the previous level and the previous display is shown again.

- When the volume is lowered by the operation of the cellular telephone muting function (**"CALL"** is shown on the display, the unit's shift Button ② and the attenuator button of the remote controller unit are disabled.

2. USING THE RADIO





1 Turn on the tuner's power by pressing button ③. Each time the button is pushed the main unit switches between tuner and power off modes.

- This operation will differ if there is a CD inserted in the CD player, or if the separately available multi play CD player is connected.

2 Press Button ① to select a band.

F I → F II → F III → M/L
(FM1) (FM2) (FM3) (MW/LW)

Use button ② to switch between MW (531-1,602 kHz) and LW (153-281 kHz).

3 Use seek tuning to tune in a frequency.
Ensure that **"MANU"** ⑪ is not indicated on the display. (If so, turn it off by simultaneously pressing the (+) and the (–) sides of button ②).
Press either the (+) side or the (–) side of button ②. When the (+) side is pressed, the tuner will automatically receive high frequencies.
When the (–) side is pressed, it will automatically receive low frequencies.

4 Adjust volume and tone.

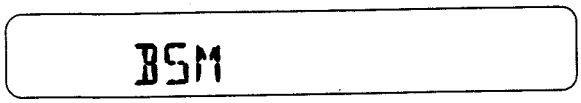
5 Assign the tuned frequency to one of the Buttons in Bank ⑧ (preset memory).
Press and hold down one of the buttons in Bank ⑧ for at least two seconds. The frequency is assigned to the selected button when the preset number ⑨ stops flashing on the display. Up to 18 FM stations (6 each for FM1, FM2 and FM3), and six MW/LW stations can be assigned to the preset memory buttons in Bank ⑧.

6 Once a frequency is assigned to a Button in Bank ⑧, you just need to press that Button to tune it in.
This also causes the number of the button pressed to appear at Position ❾ on the display.

BSM (Best Stations Memory)

This function automatically locates stronger stations and automatically assigns their frequencies to the buttons in Bank ⑧, from strongest to weakest. It comes in handy when trying to find local stations while driving.

1. Press button ① and select a band.
2. Hold down button ④. After about two seconds, a"beep" will sound to signal that the BSM search has started. At this time, "**BSM**" will flash on the display.



3. The frequency display will return once BSM search is complete, and frequencies are assigned to buttons 1 through 6 in Bank ⑧.

- At the end of the BSM search, the displayed frequency is that assigned to button 1 of Bank ⑧.
- If there are fewer than six strong stations in the area, some of the buttons in Bank ⑧ will not be assigned frequencies, so they will retain any frequencies assigned to them previously.
- BSM search may take as long as 30 seconds in areas where there are few strong stations.
- You can cancel BSM search by pressing button ④ again.

Preset Scan Tuning

This function lets you automatically monitor the stations assigned to the preset buttons.

1. Pressing button ⑦ turns on the frame of preset scan ❺ and flashes preset number ❾.
   Each station assigned to the buttons in Bank ⑧ will be automatically tuned in for about eight seconds.
2. When you hear a station that you like, press button ⑦ again to cancel preset scan tuning and remain at that station.

Manual Tuning

Use manual tuning when stations are too weak to be picked up by seek tuning.

1. Turn on "**MANU**" ❶ by simultaneously pressing the (+) side and the (–) side of button ②.
2. Each press of the (+) side of button ② increases the frequency in 50 kHz steps in the FM band, 9 kHz in the MW band and 1 kHz in the LW band. Pressing the (–) side of button ② decreases the frequency. Holding down either side of button ② changes the frequency at high speed.

Switching between FM Stereo and Mono

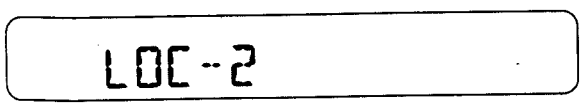
Generally, it is best to allow the ARC (Automatic Reception Control) function to automatically set the optimum listening conditions. ❿ turns on during stereo broadcast is in reception. When there is a large amount of noise, you can press button ⑤ for clearer mono reception (The frame of FM mono ❸ turns on).

Adjusting Seek Sensitivity

The seek tuning function of this tuner lets you select between a local setting for reception of strong stations only, and a DX (distant) setting for reception of weaker stations. The local setting also has four seek tuning sensitivity levels for FM and two levels for MW/LW to match local conditions.

Changing the Local Seek Sensitivity

1. Use button ① to select a band.
2. Hold down the button ⑥ for more than two seconds, and the display will show you the current local seek sensitivity for about five seconds.



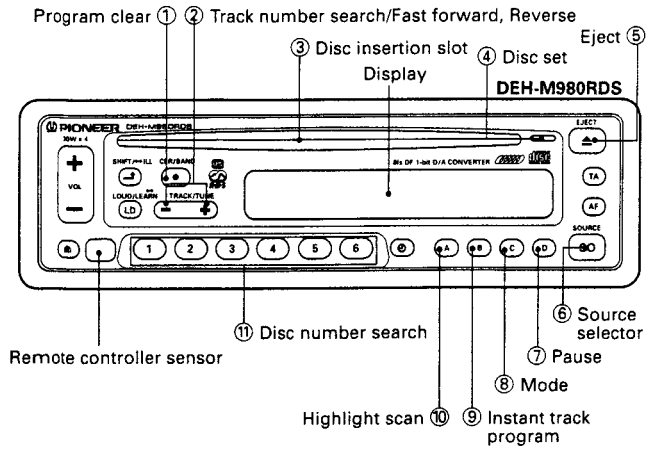
3. While the local seek sensitivity remains on the display, press the (+) side of button ② to increase the sensitivity level, and the (–) side to decrease the level as shown below.
   FM : LOC-1 ⇄ LOC-2 ⇄ LOC-3 ⇄ LOC-4
   MW/LW : LOC-1 ⇄ LOC-2
   The LOC-4 setting allows reception of only the strongest stations, while lower settings let you receive progressively weaker stations.

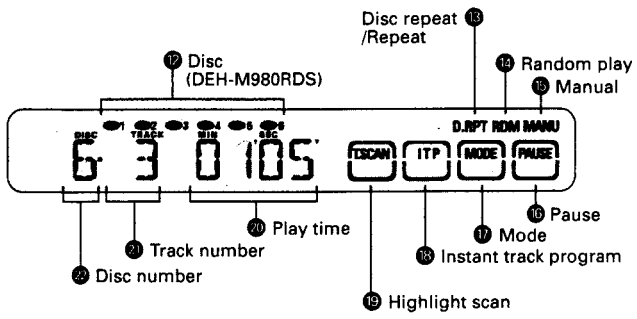
- The display of local seek sensitivity returns to the frequency when about five seconds have elapsed after the change of sensivity.

Switching between Local and DX

Press button ⑥ to switch between Local and DX (distant) seek tuning. When the frame of local seek ❹ is lit, seek tuning is performed with the local seek sensitivity. Otherwise, seek tuning is performed with the DX seek sensitivity.

3. PLAYING COMPACT DISCS





Playing Discs on the Main Unit's Built-in CD Player

1 On inserting the CD, with the label side up, half way into the CD slot ③, it will automatically be set into position and start to play. The track number ㉑ and playback time ⑳ indicators will light.

2 Adjust the volume and tone controls.

3 To stop CD playback, press button ⑥ turning the power off.
Pressing the button will change the source as follows: CD Player — Tuner — OFF.
Press button ⑥ again to restart playback. It will play from close to where it was previously stopped.

4 To remove or change discs, press button ⑤.
When the disc is ejected, pressing it will cause it to be set into position again, and playback to start.

Note:
- If a disc can only be inserted halfway, or if the disc does not play after being loaded, something may be wrong with the disc. Eject the disc by pressing button ⑤, and check it. If it is all right, insert it again.
- Insert the disc with its label (printed) side facing up. If the disc is inserted with the label side facing down, it will not play, and the recorded side may be damaged.
- The disc is set when disc set light ④ is lit. If another disc is inserted into the slot at this time, the discs may be damaged or the player may malfunction.
- Do not insert two discs into the slot at the same time. This may cause a malfunction.
- When a disc in which there are several seconds between tracks is used, the amount of elapsed disc-play time is shown, for example, as –01 and –00.

Using the multi play CD Player

The Magazine Type Multi-Play CD players with mark and the Magazines with the same mark are compatible for 5-inch (12 cm) discs.

- A separately available multi play CD player (such as the CDX-M40) is required.

1 When button ⑥ is pressed, the multi play CD player's power is turned on, and the disc number ㉒, track number ㉑, and playback time ⑳displays will light.
Pressing the button will change the source as follows: CD Player — Multi Play CD Player — Tuner — OFF.
- The source will not switch to the CD player if a disc is not inserted in the built-in CD player.
- When the multi play CD player is first connected to the main unit, the system may not operate correctly. (For example, the multi play CD player may not be selected by pushing button ⑥.) In this case, press the clear buttons on both the main unit and the multi play CD player.

2 Select a disc using disc number search.
Use the buttons ⑪ to select the desired disc. The number of the selected disc will be displayed in the display ㉒
- Display ⑫indicates whether the magazine is loaded or empty.
- If there is a tray without a disc in the magazine, that tray number will not be selected even if its button is pushed.

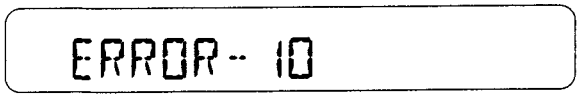
3 Adjust the volume and tone.

4 To stop play, switch the power off by pressing button ⑥.
Pressing the button will change the source as follows: CD Player — Multi-play CD player — Tuner — OFF.
Press button ⑥ again to restart playback. It will resume play from close to where it was stopped.
- When the multi play CD player (CDX-M100) is installed, if playback is stopped and then restarted, it will resume play at the beginning of the track that was stopped.

Note:
- After you press a Button in Bank ⑪, it may take some time before play begins due to the time necessary to load and set the disc in the mechanism.
- When a disc in which there are several seconds between tracks is used, the amount of elapsed disc-play time is shown, for example, as –01 and –00.

Error mode

Should an abnormality occur – for example, the built-in CD player or multi play CD player cannot be operated, or the music stops during CD playback – the main unit will indicate an error mode.



While it the unit is in error mode, a number will be displayed indicating the cause of the error, so please check the items listed below. If you cannot fix the problem after checking the cause of the error, please contact your dealer or your nearest Pioneer service center.

Note:
When using the multi-play CD player, CDX-M100, CDX-M70, CDX-M50 and CDX-M40, an error will be displayed only in the form of "ERROR-", without the number which indicated the cause of the error. When this display appears, please check items 11, 12, or 30 listed below.

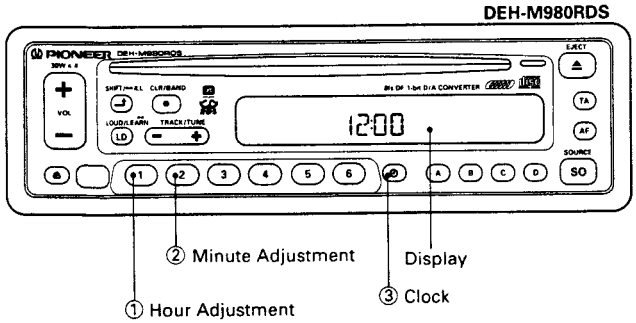
Display	Cause	Treatment
10	The CD player is not set for CD performance mode.	
11	Dirt or a scratch on the disc stops the laser beam from being able to focus. The disc has been inserted upside down.	Wipe off the dirt. Exchange the disc if it has been scratched. Confirm that the disc has been inserted right side up.
12	Discs (such as CD-ROM) other than audio discs are used.	Please set the disc for audio.
30	Dirt or a scratch on the disc hinders the track number search function.	Wipe the dirt off the disc. Exchange the disc if it is scratched.
AO	CD player power fault.	

HEAT indicator

To prevent deterioration in the semi-conductor laser from over-heating, playback of a CD will stop when the temperature surrounding the main unit and the multi play CD player rise during play.
When this occurs, "**HEAT**" will be indicated on the display. Please wait until the temperature drops.

- This function refers to the CD player component of the main unit and to the multi play CD player CDX-M100. It does not refer to other multi play CD players.

4. USING THE CLOCK DISPLAY



Displaying the Time

The clock is displayed while button ③ is depressed. Press button ③ again to turn off the clock display.

- The clock display can be used only when the main unit is in operation.
- When the clock display is ON, pressing other buttons will release the clock display. The display will be restored approximately 25 seconds after the button operation has been completed.

Adjusting the Time

Adjusting the Hours

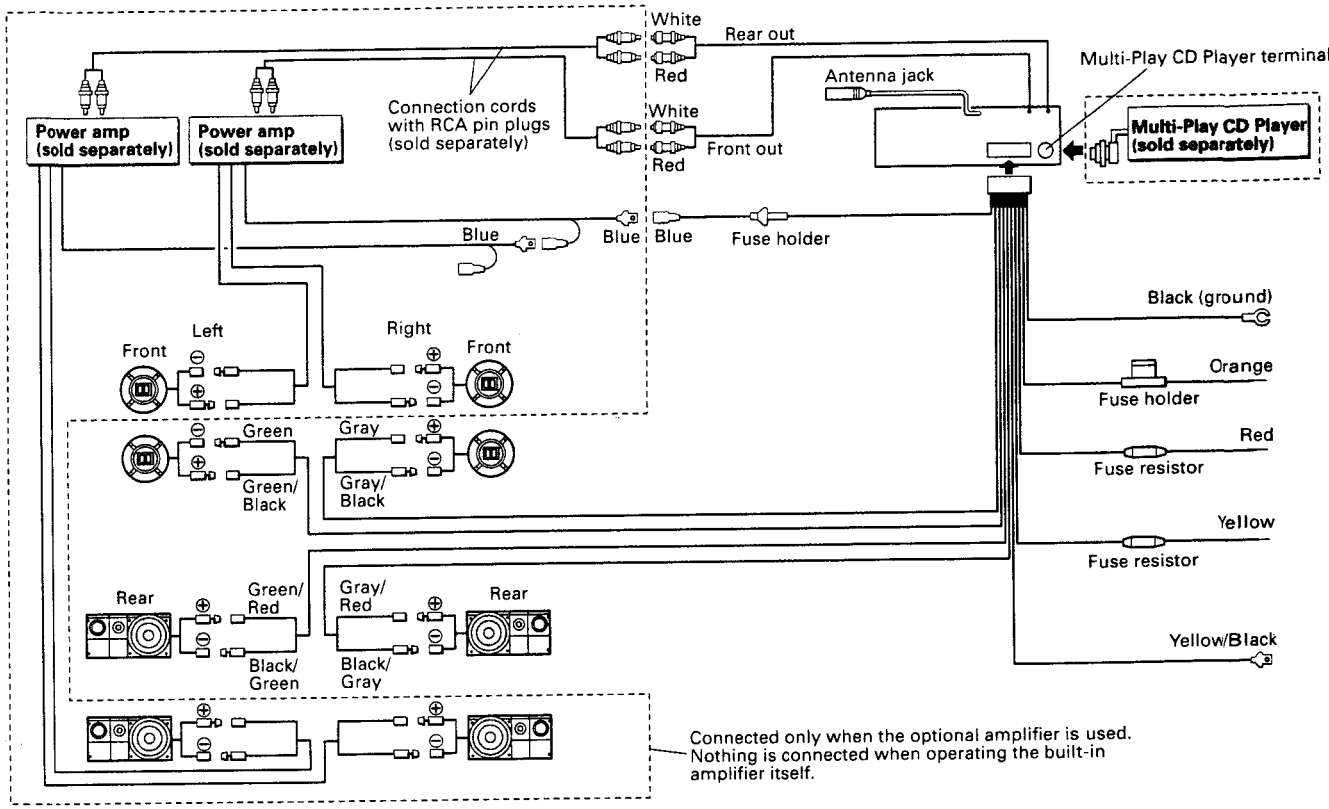
While holding down button ③, press button ① to adjust the hour setting of the clock. Each press of button ① advances the hour setting by one hour, and holding it down advances the setting at high speed.

Adjusting the Minutes

While holding down button ③, press button ② to adjust the minute setting of the clock. Each press of button ② advances the minute setting by one minute, and holding it down advances the setting at high speed.

5. CONNECTING THE UNITS

DEH-M980RDS Connection Diagram



6. FEATURES

- Multi CD Control function for full control over optional magazine type multi-play CD player.
- An 8-times-oversampling digital filter and 1-bit digital-to-analog converter allow CD's to be played with exceptional fidelity.
- Various selection functions (track number search, highlight scan, fast forward and reverse).
- RDS system provides automatic Alternative Frequency reception, Network/station name display, and traffic information reception.
- Built-in highly sensitive "Automatic Reception Control" (ARC) for automatic control of stereo separation, muting, and frequency characteristics to match the strength of the FM signal.
- The Best Stations Memory automatically memorizes the six best (strongest) stations in the six preset buttons in the order of their strength.
- Removable front panel protects against theft.
- It is possible to add the built-in high power amplifiers (30 W × 4) four-speaker system, using optional outside amplifiers to create an eight-speaker system.

7. SPECIFICATIONS

DEH-M980RDS/EW

General

Power source ..... 14.4 V DC (10.8 – 15.6 V allowable)
Grounding system ..... Negative type
Max. current consumption ..... 10 A
Dimensions (chassis) ..... 180(W) × 50(H) × 155(D) mm
(front face) ..... 188(W) × 58(H) × 18(D) mm
Weight ..... 1.6 kg

Amplifier

Max. power output ..... 30 W × 4
Continuous power output ..... 14 W × 4
(1 % dist. at 1 kHz)
Load impedance ..... 4 Ω (4 – 8 Ω allowable)
Nominal output level/
output impedance (pre out) ..... 500 mV/1 kΩ
Tone controls (bass) ..... ±12 dB (100 Hz)
(middle) ..... ±12 dB (1 kHz)
(treble) ..... ±12 dB (10 kHz)
Loudness contour ..... +10 dB (100Hz), +6.5 dB (10 kHz)
(volume: –30 dB)

CD player

System ..... Compact disc audio system
Usable discs ..... Compact disc
Signal format ..... Sampling frequency: 44.1 kHz
Number of quantization bits: 16; linear
Frequency characteristics ..... 5–20,000 Hz (±1 dB)
Signal-to-noise ratio ..... 94 dB (1 kHz) (IEC-A network)
Dynamic range ..... 90 dB (1 kHz)
Number of channels ..... 2 (stereo)

FM tuner

Frequency range ..... 87.5 – 108 MHz
Usable sensitivity ..... 8 dBf (0.7 µV/75 Ω, mono, S/N: 30 dB)
50 dB quieting sensitivity ..... 13 dBf (1.2µV/75 n, mono)
Signal-to-noise ratio ..... 70 dB (IEC-A network)
Distortion ..... 0.3 % (at 65 dBf, 1 kHz, stereo)
Frequency response ..... 30 – 15,000 Hz (±3 dB)
Stereo separation ..... 40dB (at 65 dBf, 1 kHz)

MW tuner

Frequency range ..... 531–1,602 kHz
Usable sensitivity ..... 18 µV (25 dB) (S/N: 20 dB)
Selectivity ..... 50 dB (±9 kHz)

LW tuner

Frequency range ..... 153-281 kHz
Usable sensitivity ..... 30 µV (30 dB) (S/N: 20 dB)
Selectivity ..... 50 dB (±9 kHz)

Note:
Specifications and the design are subject to possible modification with-out notice due to improvements.

DEH-M980/UC, M77/US

General

Power source ..... 14.4 V DC (10.8 – 15.6 V allowable)
Grounding system ..... Negative type
Max. current consumption ..... 10 A
Dimensions (chassis) ..... 178(W) × 50(H) × 155(D) mm
[7(W) × 2(H) × 6-1/8(D) in.]
(nose) ..... 188(W) × 58(H) × 18(D) mm
[7-3/8(W) × 2-1/4(H) × 3/4(D) in.]
Weight ..... 1.6 kg (3.5 lbs)

Amplifier

Continuous power output is 10 W per channel min. into 4Ω, both channels driven 50 to 15,000 Hz with no more than 5% THD.
Max. power output ..... 30 W × 4 (EIAJ)
Load impedance ..... 4 Ω (4 – 8 Ω allowable)
Nominal output level/
output impedance (pre out) ..... 500 mV/1 kΩ
Tone controls (bass) ..... ±12 dB (100 Hz)
(middle) ..... ±12 dB (1 kHz)
(treble) ..... ±12 dB (10 kHz)
Loudness contour ..... +10 dB (100Hz), +6.5 dB (10 kHz)
(volume: –30 dB)

CD player

System ..... Compact disc audio system
Usable discs ..... Compact disc
Signal format ..... Sampling frequency: 44.1 kHz
Number of quantization bits: 16; linear
Frequency characteristics ..... 5 – 20,000 Hz (±1 dB)
Signal-to-noise ratio ..... 94 dB (1 kHz) (IHF-A network)
Dynamic range ..... 90 dB (1 kHz)
Number of channels ..... 2 (stereo)

FM tuner

Frequency range ..... 87.9 – 107.9 MHz
Usable sensitivity ..... 8 dBf (0.7 µV/75 Ω, mono, S/N: 30 dB)
50 dB quieting sensitivity ..... 13 dBf (1.2µV/75 n, mono)
Signal-to-noise ratio ..... 70 dB (IHF-A network)
Distortion ..... 0.3 % (at 65 dBf, 1 kHz, stereo)
Frequency response ..... 30 – 15,000 Hz (±3 dB)
Stereo separation ..... 40dB (at 65 dBf, 1 kHz)
Selectivity ..... 70dB (2ACA) (±400 kHz)
Three-signal intermodulation (desire signal level)
..... 35 dBf (two undesire signal level: 110 dBf)

AM tuner

Frequency range ..... 530 – 1,710 kHz
Usable sensitivity ..... 18 µV (25 dB) (S/N: 20 dB)
Selectivity ..... 50 dB (±10 kHz)

These specifications were determined and are presented in accordance with specification standards established by the Ad Hoc Committee of Car Stereo Manufacturers.

Note:
Specifications and the design are subject to possible modification with-out notice due to improvements.

8. BLOCK DIAGRAM

• DEH-M980RDS/EW

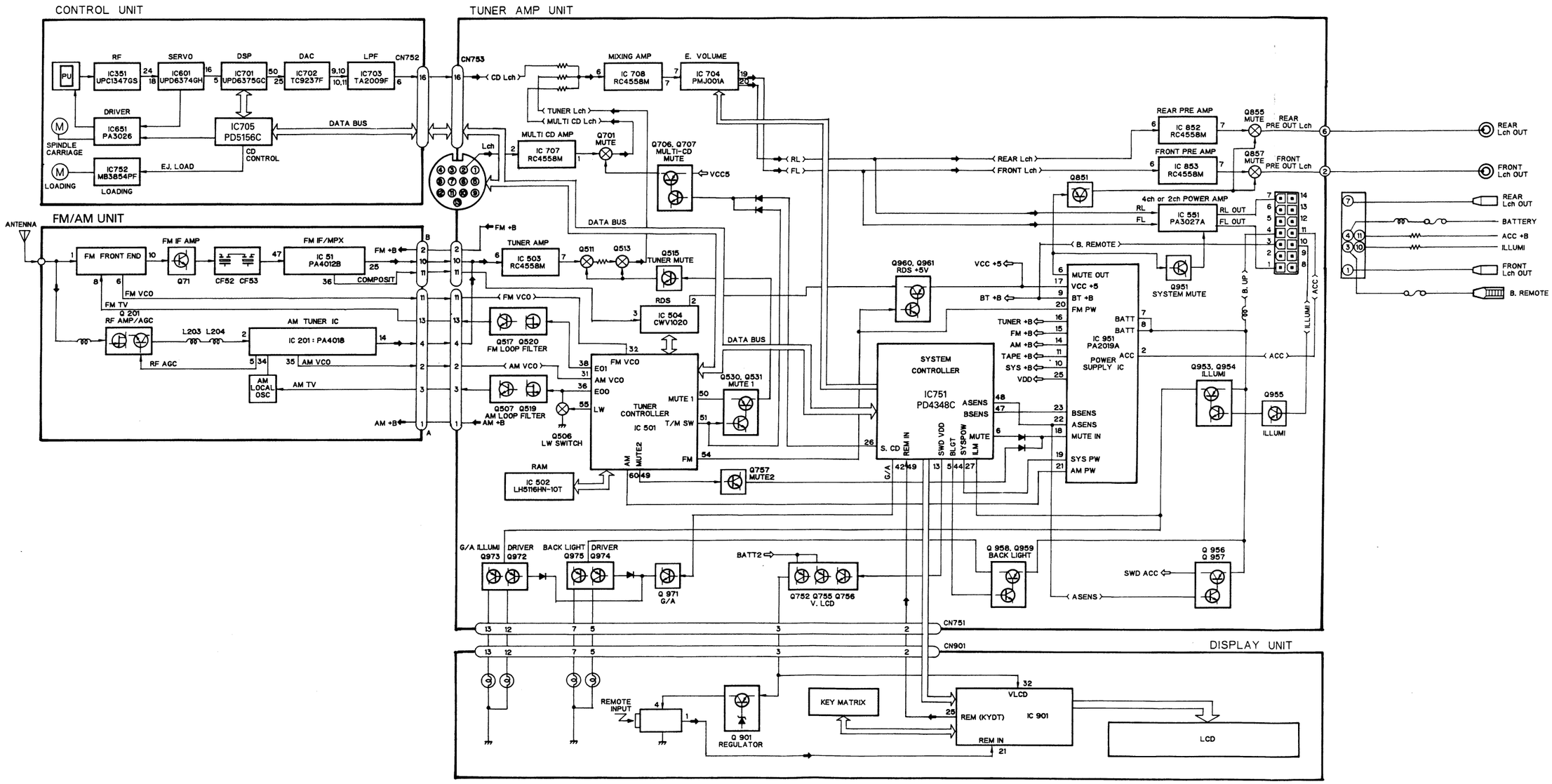


Fig. 1

- **DEH-M980/UC, M940/ES**

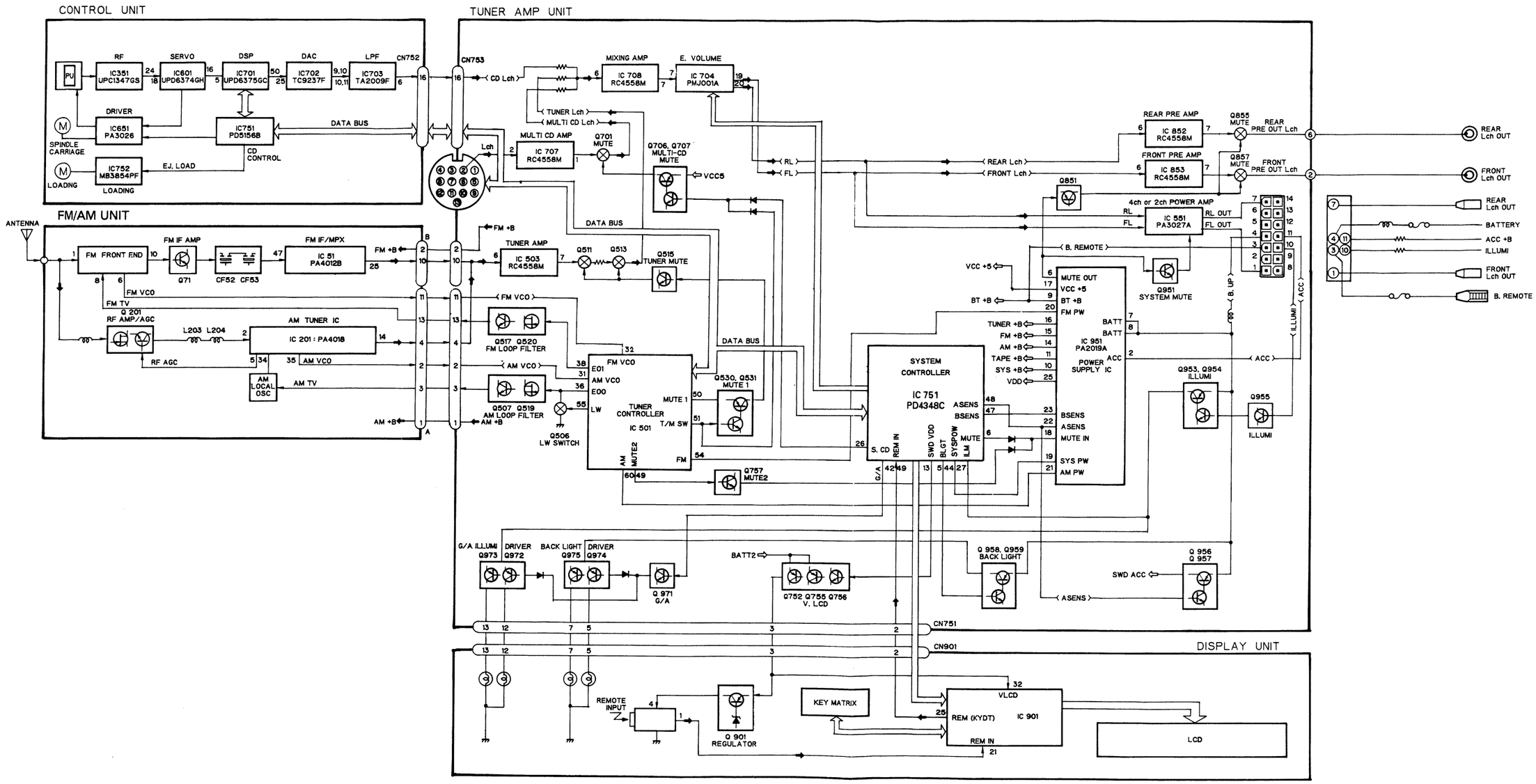


Fig. 2

• **DEH-M77/US**

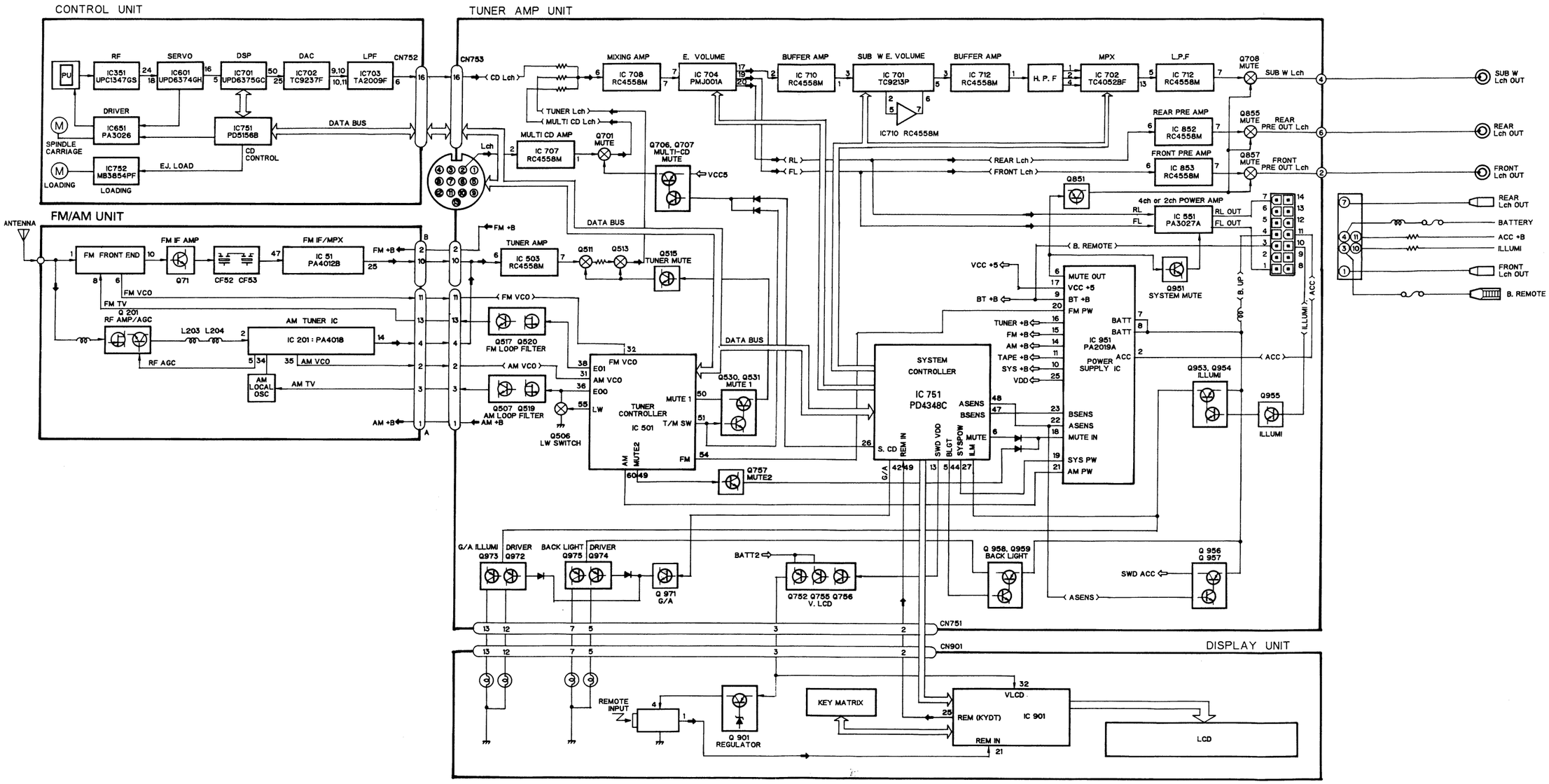


Fig. 3

9. DISASSEMBLY

• Case

1. Remove the three screws.
2. Insert and turn a screwdriver at locations indicated by arrows to remove the case.

• Front Panel

1. Press the detach button, and then pull front panel.

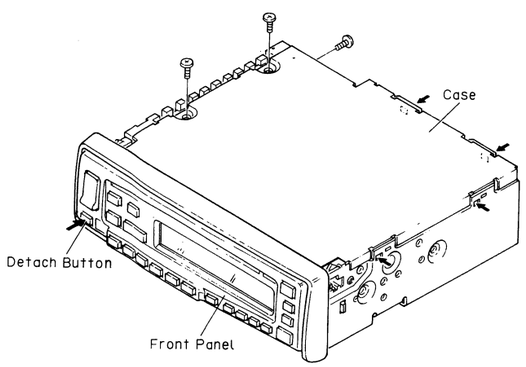


Fig. 4

• Grille Unit

1. Disconnect the two stoppers indicated by arrow.
2. Disconnect the connector.
3. Remove the grille unit.

• CD Mechanism Module

1. Remove the four screws.
2. Disconnect the connector.
3. Remove the CD mechanism module.

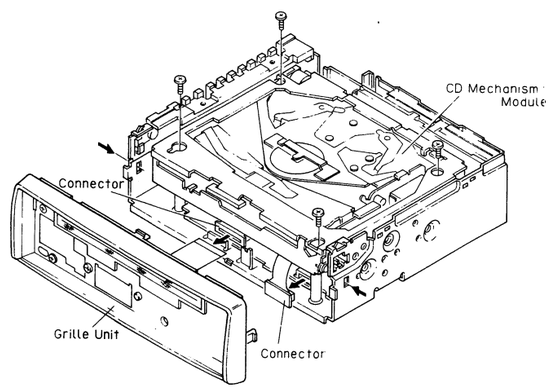


Fig. 5

1. Remove the four screws A and the three screws B.
2. Remove the heat sink.
3. Remove the three screws C and the screw D, and then remove the holder.
4. Stretch the four claws.
5. Remove the chassis unit.

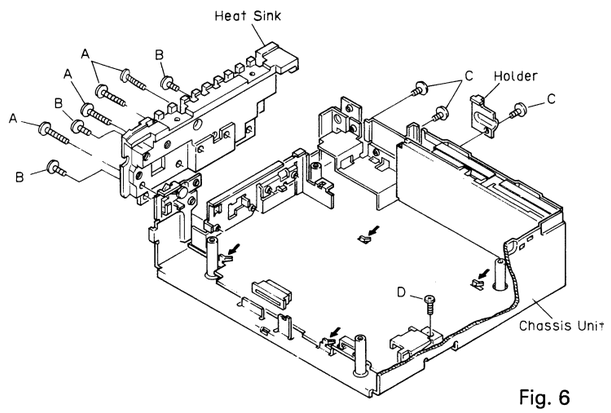


Fig. 6

• PU Unit, Carriage Motor Assy

1. Remove the spring B as indicated by the arrow. (Fig.7)
2. Remove the spring A. (Fig. 7)
3. Remove the engagement as indicated by the arrows 1 and 2, and then remove the clamper assy. (Fig. 7)

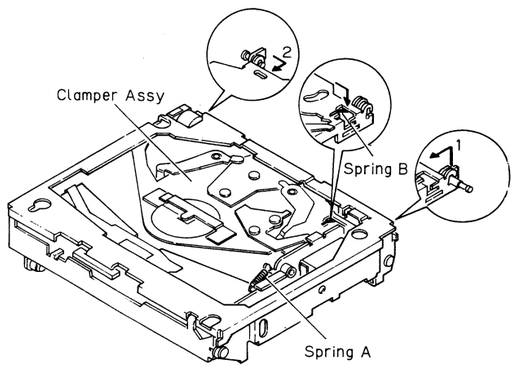


Fig. 7

4. Fix short pin when removing the CN351 connector. (For protection of the PU unit.) (Fig. 8)
5. Remove the three screws. (Fig. 8)
6. Since the control unit is connected to the switch substrate by means of connector, disconnect the connector and then remove the control unit right downward. (Fig. 8)

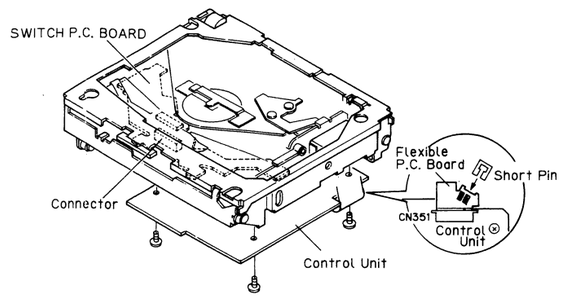


Fig. 8

11. Remove the screw, and then remove the carriage motor assy. (Fig. 10)

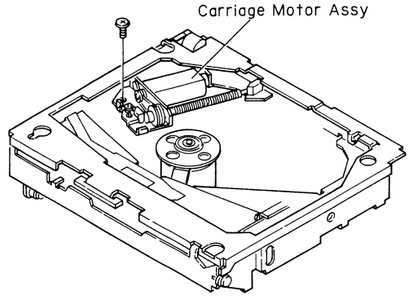


Fig. 10

7. Hook the spring as shown in the figure. (Fig. 9)
8. Remove the holder and screw. (Fig. 9)
9. Remove the flexible P.C. board. (Fig. 9)
10. Remove the PU unit. (Fig. 9)

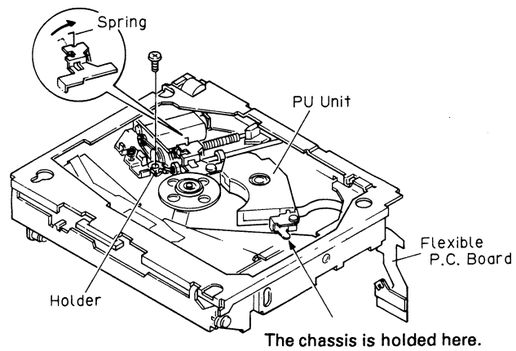


Fig. 9

• Damper Unit, Loading Motor

1. Turn the gear A manually in the arrow direction. (Fig. 11)
2. Press the rack gear in the arrow direction and engage gears. (Fig. 11)
3. Put into the play mode. (The clamper assembly is at low position.) (Fig. 11)

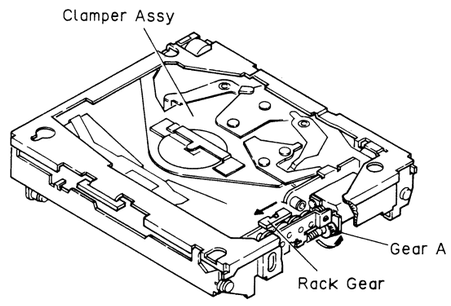


Fig. 11

4. Remove the four springs indicated by arrow. (Fig. 12)
5. Remove the two screws A, and then remove the side frame assy. (Fig. 12)
6. Remove the two screws B, and then remove the damper assy. (Fig. 12)

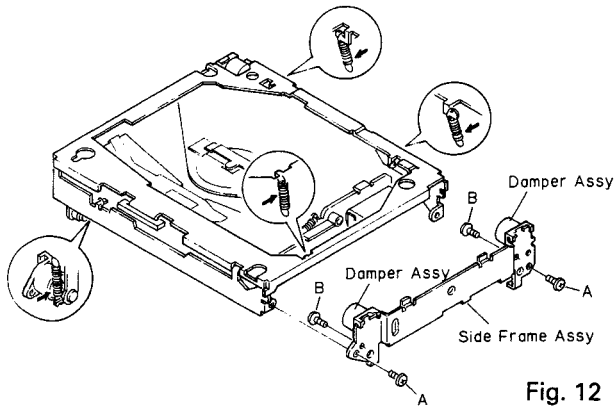


Fig. 12

7. Remove the frame assembly from the mechanical parts. (Fig. 13)
8. Remove the two screws C, and then remove the damper assy. (Fig. 13)
9. Remove the clamper assembly as shown in Fig. 13.

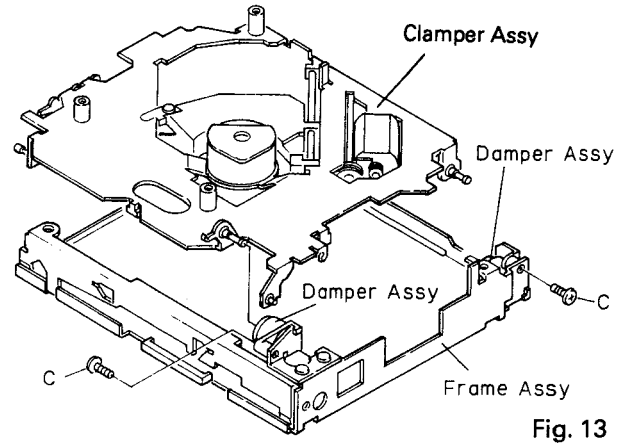


Fig. 13

10. Turn the Loading gear to put into the ejection. (Fig. 14)
11. Remove one of the screws and remove the gear unit pressing the arm slightly toward the arrow. (Fig. 14)

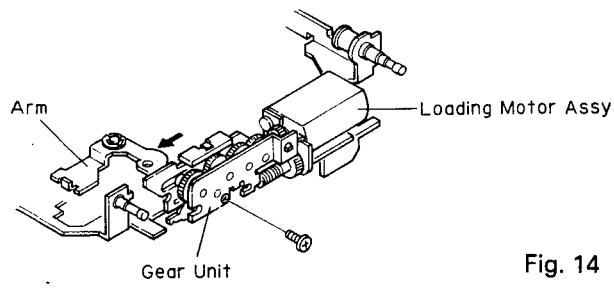


Fig. 14

12. Remove the screw, and then remove the loading motor assy. (Fig. 15)

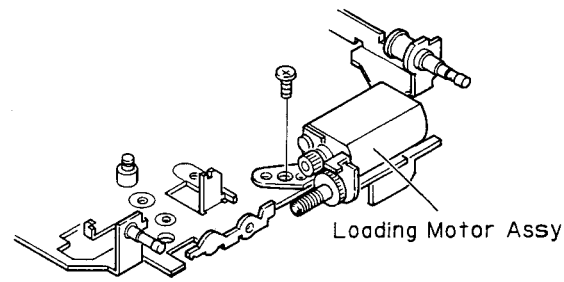


Fig. 15

- **Gear Unit**

13. Shift lever as shown in Fig. 16.
14. Remove the shaft A from C of lever.
15. Shift the gear as shown in Fig. 16.
16. Remove the shaft B from C of lever.

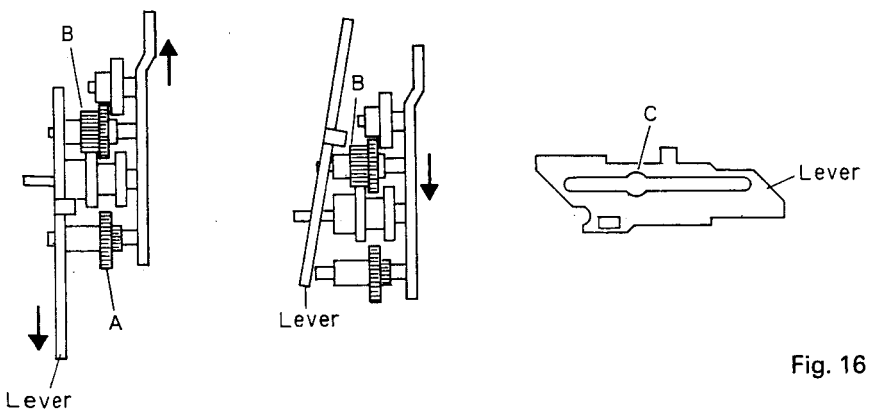


Fig. 16

10. ADJUSTMENT

1)Precautions

- This unit uses a single power supply (+5V) for the regulator. The signal reference potential,therefore,is connected to REFOUT(approx. 2.5V) instead of GND.

If REFOUT and GND are connected to each other by mistake during adjustments,not only will it be impossible to measure the potential correctly,but the servo will malfunction and a severe shock will be applied to the pick-up. To avoid this,take special note of the following.

Do not connect the negative probe of the measuring equipment to REFOUT and GND together. It is especially important not to connect the channel 1 negative probe of the oscilloscope to REFOUT with the channel 2 negative probe connected to GND.

And since the frame of the measuring instrument is usually at the same potential as the negative probe,change the frame of the measuring instrument to floating status.

If by accident REFOUT comes in contact with GND,immediately switch the regulator or power OFF.

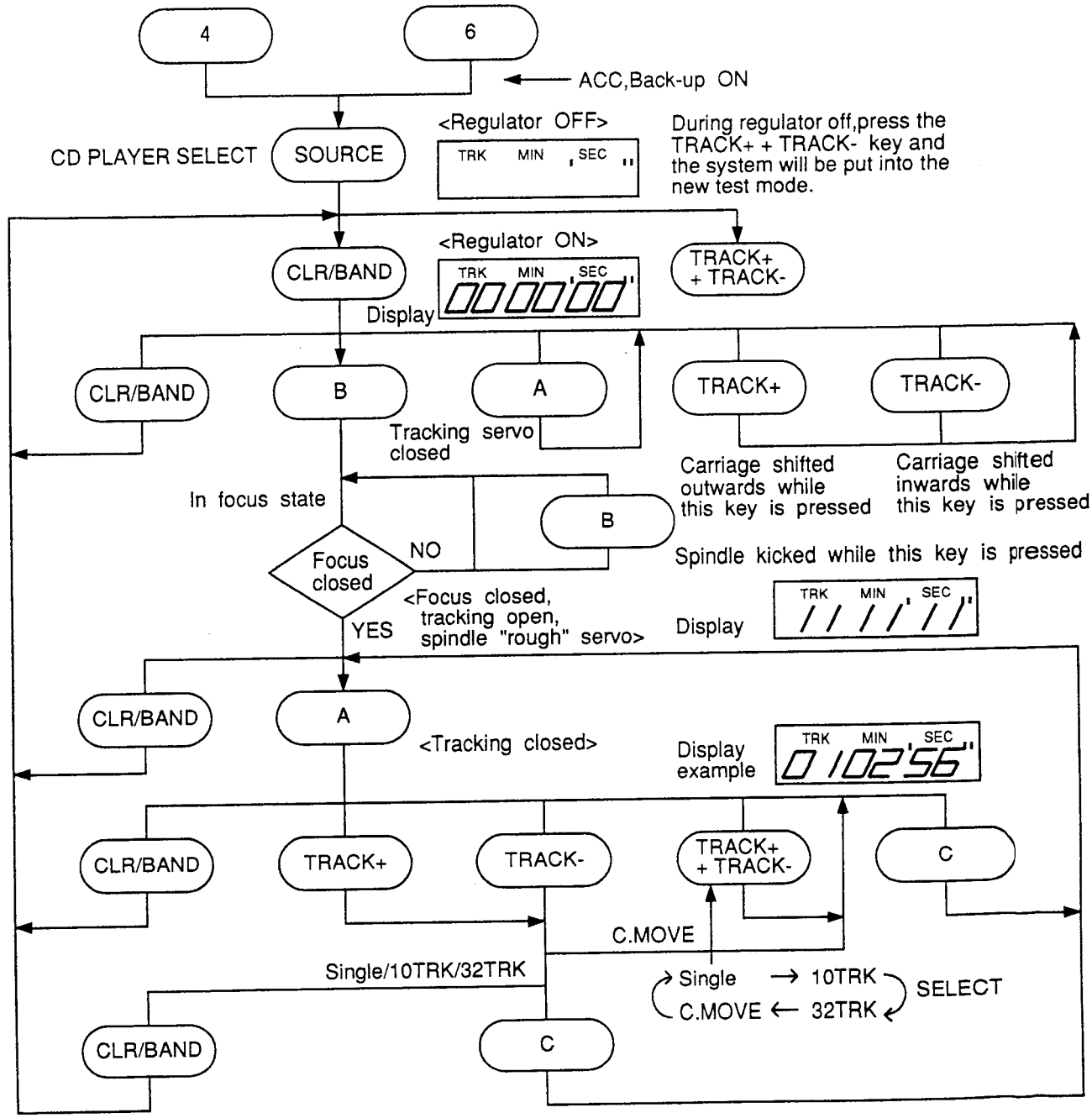
- Always make sure the regulator is OFF when connecting and disconnecting the various filters and wiring required for measurements.
- Before proceeding to further adjustments and measurements after switching regulator ON,let the player run for about one minute to allow the circuits to stabilize.
- Since the protective systems in the unit's software are rendered inoperative in test mode,be very careful to avoid mechanical and /or electrical shocks to the system when making adjustment.
- Test mode starting procedure
  Switch ACC,back-up ON while pressing the 4 and 6 keys together.
- Test mode cancellation
  Switch ACC,back-up OFF.
- Disc detection during loading and eject operations is performed by means of a photo transistor in this unit.Consequently,if the inside of the unit is exposed to a strong light source when the outer casing is removed for repairs or adjustment,the following malfunctions may occur.
  *During PLAY, even if the eject button is pressed,the disc will not be ejected and the unit will remain in the PLAY mode.
  *The unit will not load a disc.
  When the unit malfunctions this way,either reposition the light source,move the unit or cover the photo transistor.
- When loading and unloading discs during adjustment procedures,always wait for the disc to be properly clamped or ejected before pressing the another key. Otherwise, there is risk of the actuator being destroyed.
- Turn power off when pressing the TRACK+ or the TRACK- key for focus search in the test mode. (Or else lens may stick and the actuator may be damaged.)

Key	Function
CLR/BAND	RegulatorON/OFF
TRACK+	FWD Kick
TRACK-	REV Kick
EJECT	EJECT
TRACK+ + TRACK-	Jump mode

Key	Function
A(SCAN)	Tracking close
C(MODE)	Tracking open
B(ITP)	Focus close
SOURCE	CD ON/OFF

- SINGLE/10TRK/32TRK will continue to operate even after the key is released.Tracking closed the moment C-MOVE is released.
- JUMP MODE resets to SINGLE as soon as power is off.

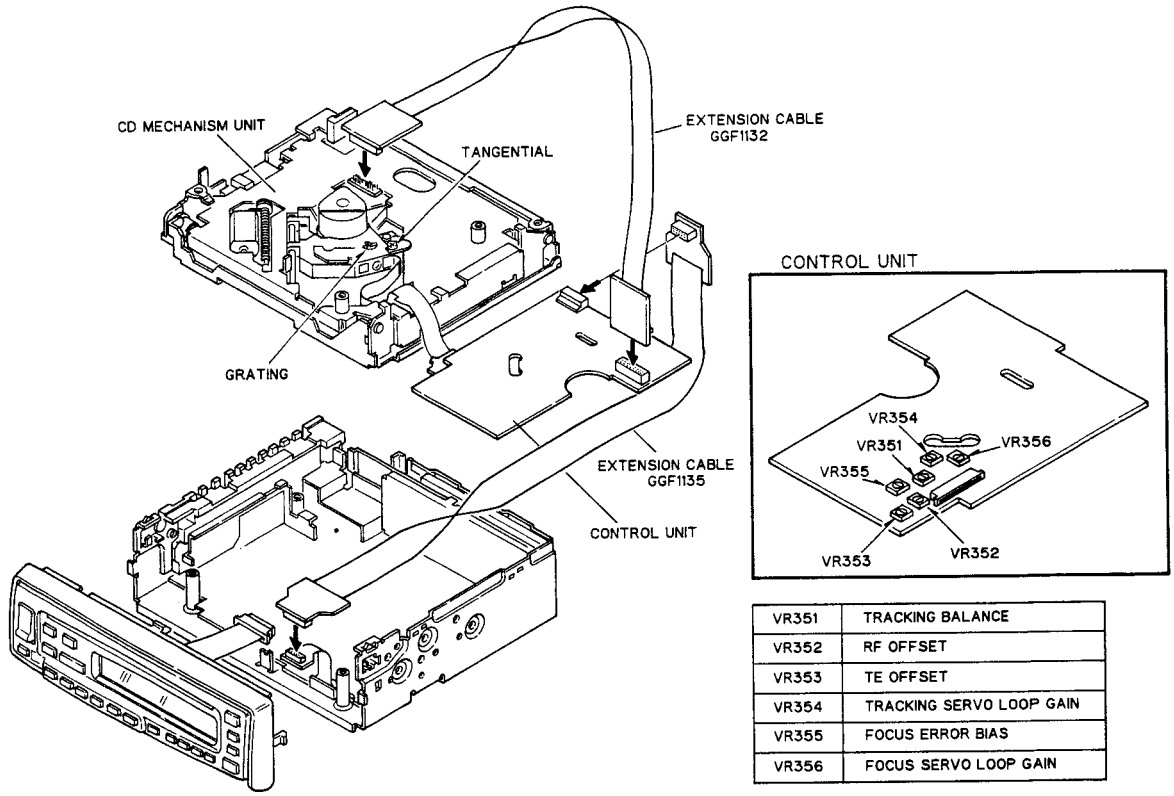
• **Flow Chart**


4
6
ACC,Back-up ON
CD PLAYER SELECT
SOURCE
<Regulator OFF>
TRK MIN SEC
During regulator off,press the TRACK+ + TRACK- key and the system will be put into the new test mode.
<Regulator ON>
CLR/BAND
TRACK+ + TRACK-
Display
TRK MIN SEC
CLR/BAND
B
A
TRACK+
TRACK-
Tracking servo closed
Carriage shifted outwards while this key is pressed
Carriage shifted inwards while this key is pressed
In focus state
B
Focus closed
NO
YES
<Focus closed, tracking open, spindle "rough" servo>
Spindle kicked while this key is pressed
Display
CLR/BAND
A
<Tracking closed>
Display example
CLR/BAND
TRACK+
TRACK-
TRACK+ + TRACK-
C
C.MOVE
Single/10TRK/32TRK
Single → 10TRK
C.MOVE ← 32TRK
SELECT
CLR/BAND
C

• **Measuring Equipment & Jigs**

Adjustment	Measuring equipment&jigs
Grating Adjustment	Oscilloscope,clock driver,grating adjustment filter (bandpass filter) (GGF-133), AC millivoltmeter SONY TYPE 4 (or TYPE 3) Extension Cable:GGF1132,GGF1135
Tangential Skew Check	Oscilloscope,screwdriver SONY TYPE 4 (or TYPE 3) Extension Cable:GGF1132,GGF1135
Grating Adjustment	Oscilloscope,clock driver,two low-pass filters SONY TYPE 4 (or TYPE 3) Extension Cable:GGF1132,GGF1135
FE Bias Adjustment	Oscilloscope SONY TYPE 4 (or TYPE 3) Extension Cable:GGF1132,GGF1135
RF Offset Adjustment	Oscilloscope SONY TYPE 4 (or TYPE 3) Extension Cable:GGF1132,GGF1135
TE Offset Adjustment-1	DC voltmeter Extension Cable:GGF1132,GGF1135
Tracking Balance Adjustment-1	Oscilloscope SONY TYPE 4 (or TYPE 3) Extension Cable:GGF1132,GGF1135
Focus Servo Loop Gain Adjustment	Oscillator,gain adjustment filter (GGF-065), dual meter milli-voltmeter SONY TYPE 4 (or TYPE 3) Extension Cable:GGF1132,GGF1135
Tracking Servo Loop Gain Adjustment	Oscillator,gain adjustment filter (GGF-065), dual meter milli-voltmeter SONY TYPE 4 (or TYPE 3) Extension Cable:GGF1132,GGF1135
TE Offset Adjustment-2	DC voltmeter Extension Cable:GGF1132,GGF1135
Tracking Balance Adjustment-2	Oscilloscope SONY TYPE 4 (or TYPE 3) Extension Cable:GGF1132,GGF1135

• Adjustment Point



VR351	TRACKING BALANCE
VR352	RF OFFSET
VR353	TE OFFSET
VR354	TRACKING SERVO LOOP GAIN
VR355	FOCUS ERROR BIAS
VR356	FOCUS SERVO LOOP GAIN

Fig. 17

Note:
CD mechanism module can be adjusted without removing control unit.

• Test Point

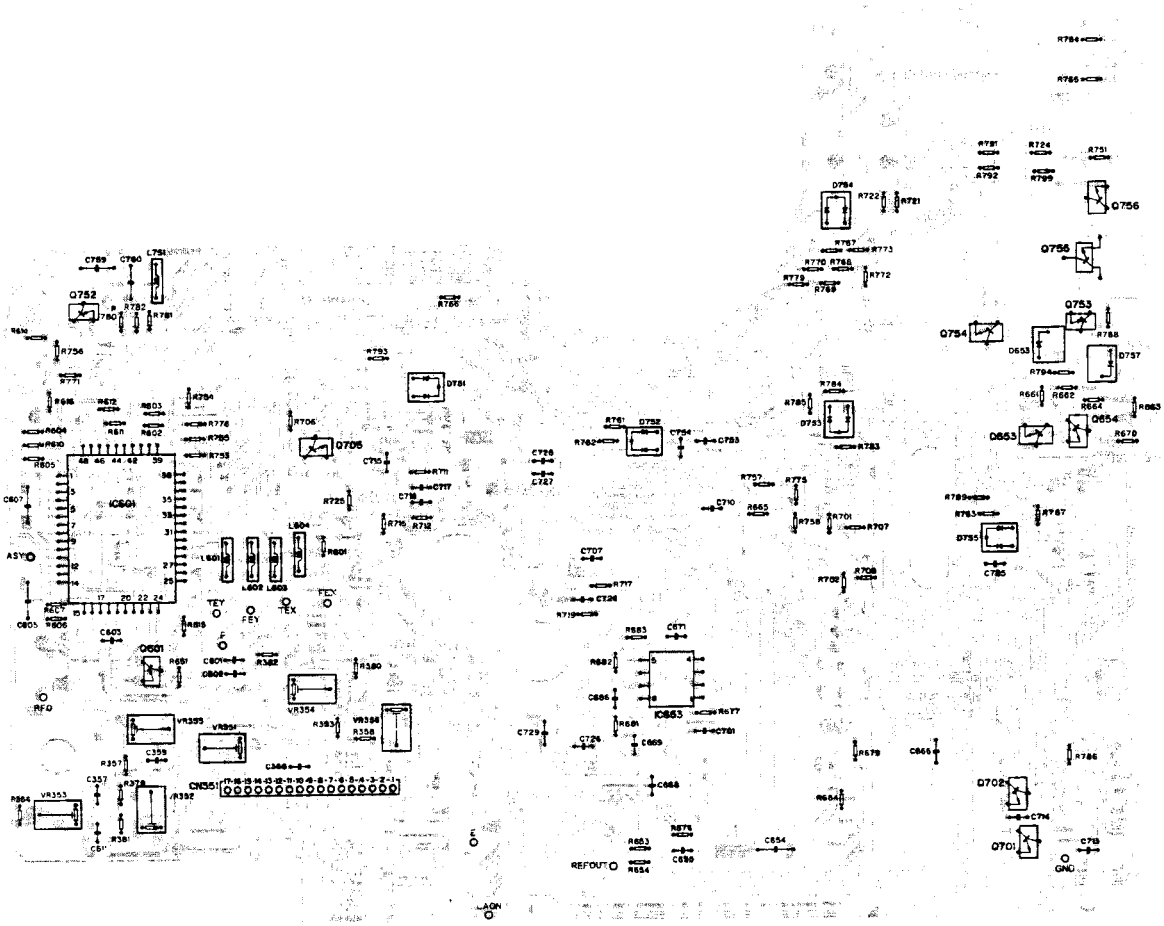


Fig.18

10.1 Grating Adjustment (Rough adjustment)

- Purpose: The grating may need adjustment in a replaced pick-up unit.
- Maladjustment symptoms: No disc playback;track jumping.

• Measuring equipment / jigs • Measuring point • Test disc and setting • Adjustment position	• Oscilloscope,clock driver,grating adjustment filter (bandpass filter)(GGF-133),AC millivoltmeter • TEY • SONY TYPE 4 (or TYPE 3) • Test mode • Pick-up grating adjustment hole

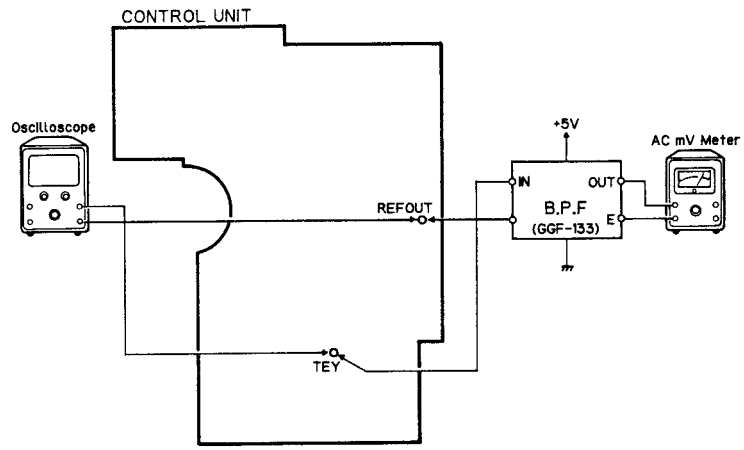
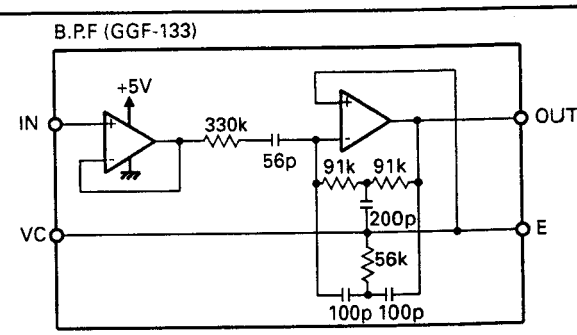


Fig. 19

Adjustment Procedure

1. Switch regulator ON in test mode,and load a disc.
2. Use **TRACK+** or **TRACK-** key as required to bring pick-up at the adjusting hole on control unit (tune TNO 6). (TYPE 3:TNO 7)
   Mutch with TNO 6 (TYPE 3:TNO 7) when releweing the control unit.
3. Press the **B** key to close focus.
4. While monitoring the TEY filter output by AC milli-voltmeter,turn the grating adjustment hole slowly. The AC voltage increases and decreases while turning the screw. Search for the minimum voltage level. (This corresponds to the position where the grating is on a track,and is referred to as the null point.)
5. Then while monitoring TEY by oscilloscope,turn the driver slowly clockwise from the null point (as seen from under the pick-up) until the first waveform peak amplitude is reached.



10.2 Tangential Skew Check

- Purpose: To check whether tangential skew has been misaligned or not when replacing the pick-up unit.
- Maladjustment symptoms: No disc playback;track jumping.

• Measuring equipment / jigs	• Oscilloscope,screwdriver
• Measuring point	• RFO
• Test disc and setting	• SONY TYPE 4 (or TYPE 3) • Normal mode
• Adjustment position	• Pick-up tangential adjustment screw

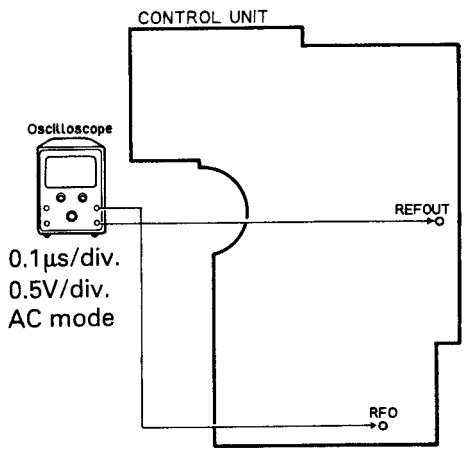
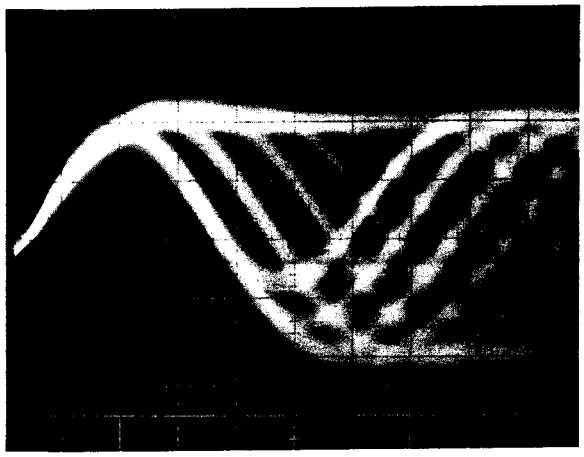


Fig. 20

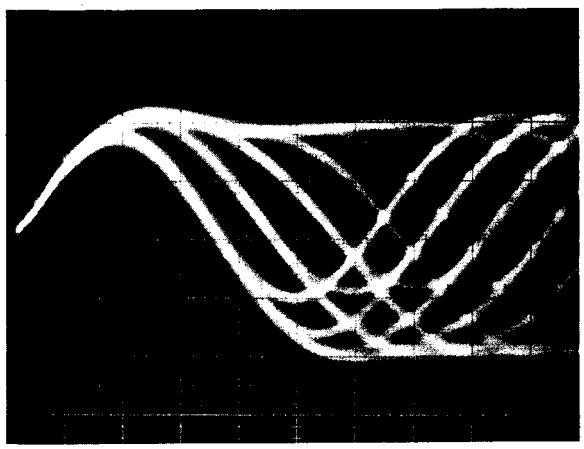
Adjustment Procedure

1. Check that the pick up position does not differ from that at the same time of grating adjustment.(TYPE 4:TNO 6,TYPE 3:TNO 7)
2. Turn the tangential adjustment screw to obtain a good RF waveform eye pattern. Turn the adjustment screw both clockwise and counterclockwise to points where the eye pattern deteriorates,and take the midway point as the adjustment point. As a general guide,look for an overall clear waveform,and one of the diamond shapes in the eye pattern. The diamond shapes should appear in fine lines at the point of optimum adjustment. Take care not to knock the pick-up with the screwdriver at this stage. (This kind of accident can result in loss of focus.) (See Fig.21,22)
3. Apply "screw-lock" to the tangential adjustment screw.
4. After adjusting tangential skew,also adjust the grating.



NG

Fig. 21



OK

AC Mode
0.5V/div.
0.1µs/div.

Fig. 22

10.3 Grating Adjustment (Fine adjustment)

- Purpose: The grating may need adjustment in a replaced pick-up unit.
- Maladjustment symptoms: No disc playback;track jumping.

• Measuring equipment / jigs	• Oscilloscope,clock driver,two low-pass filters
• Measuring point	• TEY,E LPF output,F LPF output
• Test disc and setting	• SONY TYPE 4 (or TYPE 3) • Test mode
• Adjustment position	• Pick-up grating adjustment hole

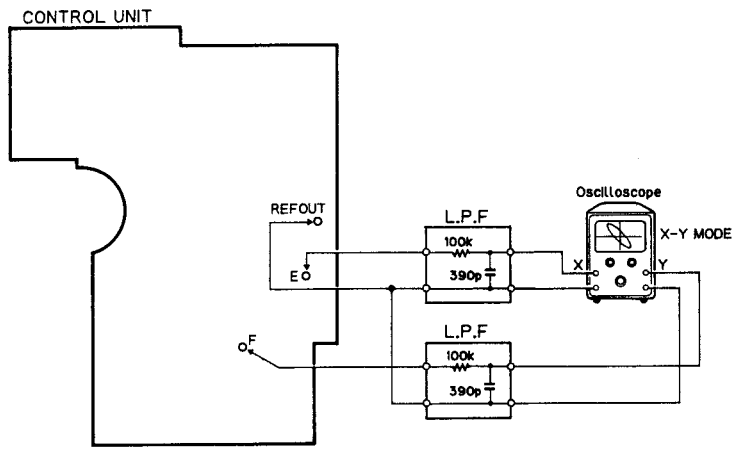


Fig. 23

Adjustment Procedure

1. Switch regulator ON in test mode,and load a disc.
2. Use **TRACK+** or **TRACK-** key as required to bring pick-up at the adjusting hole on control unit (tune TNO 6). (TYPE 3:TNO 7)
   Mutch with TNO 6 (TYPE 3:TNO 7) when relewe-ing the control unit.
3. Press the **B** key to close focus.
4. With the E low-pass filter output connected to the X axis of the oscilloscope,and the F low-pass filter output connected to the Y axis,apply an in-put in AC mode and observe the Lissajous fig-urs.(Fig.24-29)
5. Using the driver,adjust the Lissajous figure to a single line (or as close as possible)
6. Switch regulator OFF and remove the filters.

TEY waveform 5ms/div,0.5V/div.

Null Point

Lissajous figure (AC input)
Horizontal axis E 20mV/div.
Vertical axis F 20mV/div.

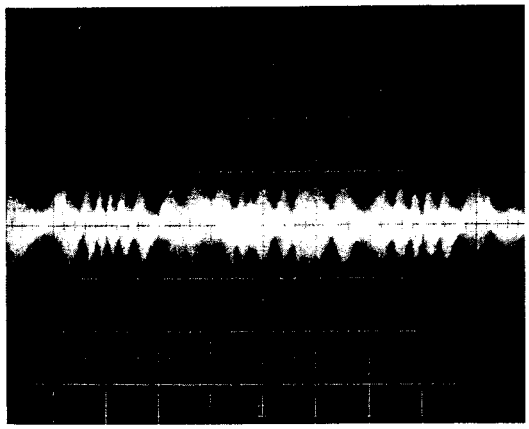


Fig. 24

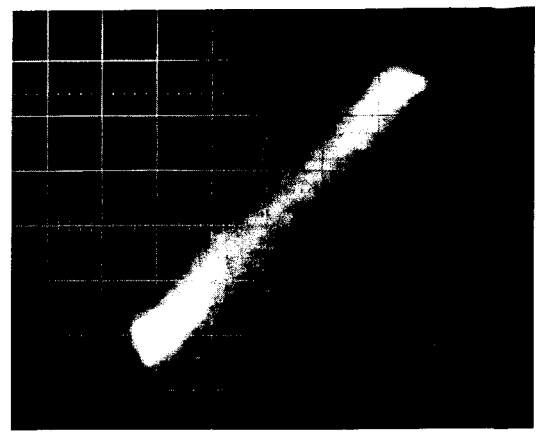


Fig. 25

"Rough" adjustment

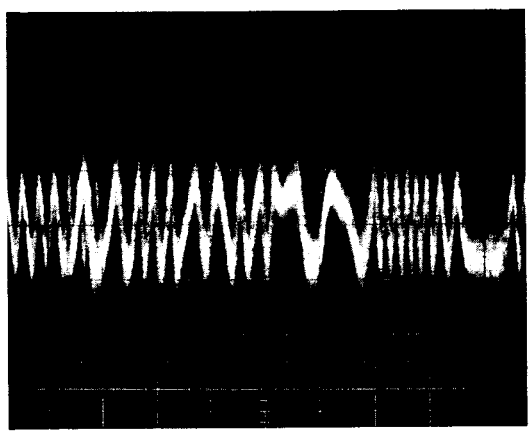


Fig. 26

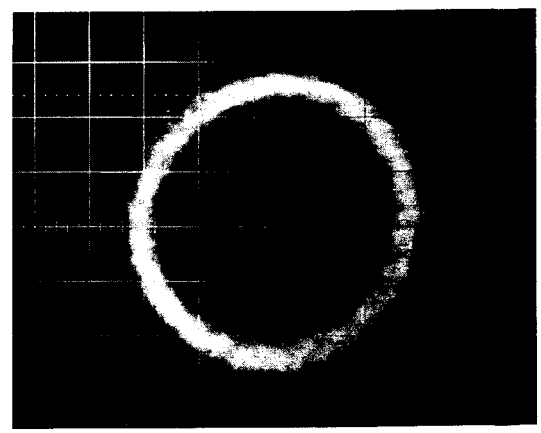


Fig. 27

Final adjustment

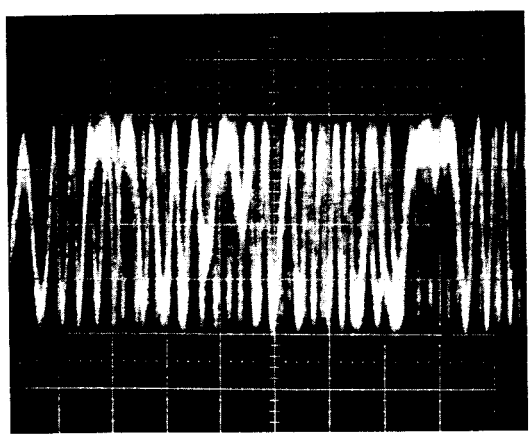


Fig. 28

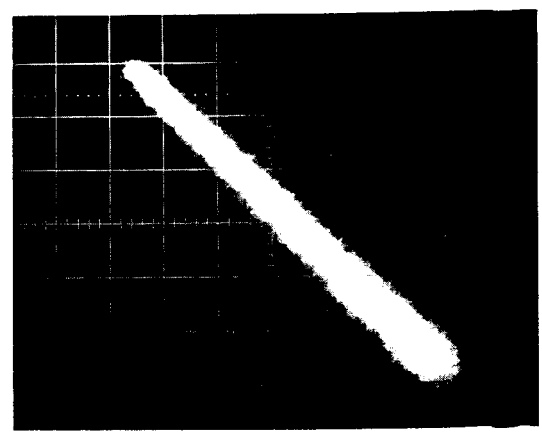


Fig. 29

10.4 FE Bias Adjustment

- Purpose: To adjust the focus servo bias to an optimum value.
- Maladjustment symptoms: Focus closing difficulty,poor playability.

• Measuring equipment / jigs	• Oscilloscope
• Measuring point	• RFO
• Test disc and setting	• SONY TYPE 4 (or TYPE 3) • Normal mode
• Adjustment position	• VR355(FEB)

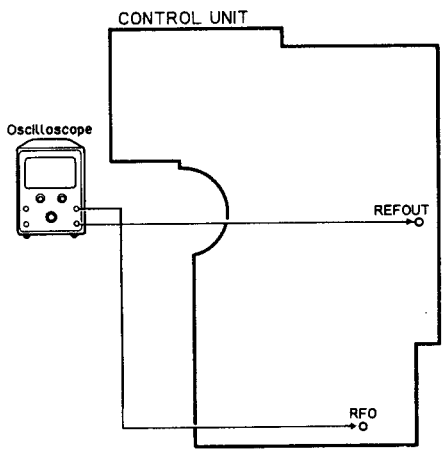
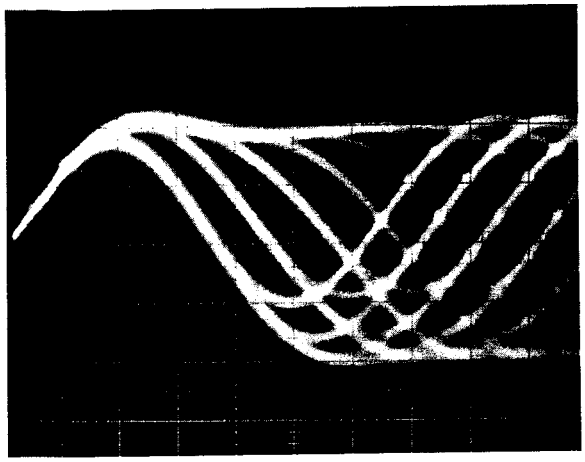


Fig. 30

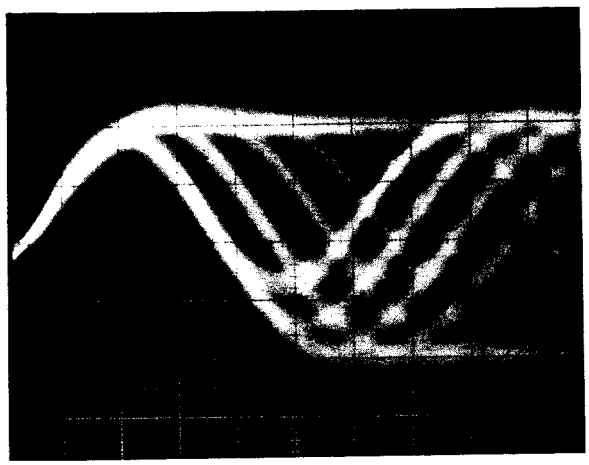
Adjustment Procedure

1. Play in normal mode.
2. Observe RFO in respect to REFOUT in the oscilloscope,and adjust VR355(FEB) to obtain maximum RF and optimum eye pattern. (See Fig.31,32)



OK

Fig. 31

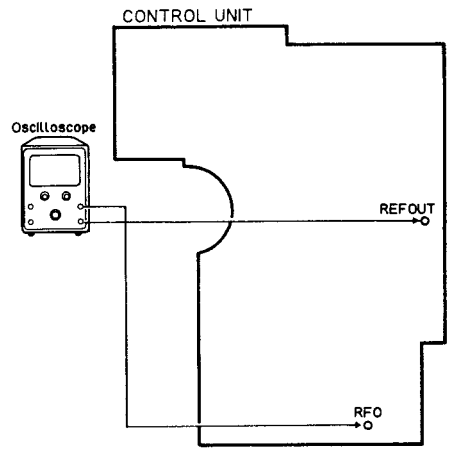


AC Mode Before adjustment Fig. 32

10.5 RF Offset Adjustment

- Purpose: To adjust the RF amplifier offset to a suitable value.
- Maladjustment symptoms: Focus closure fails readily.

• Measuring equipment / jigs	• Oscilloscope
• Measuring point	• RFO
• Test disc and setting	• SONY TYPE 4 (or TYPE 3) • Normal mode
• Adjustment position	• VR352(RFO)

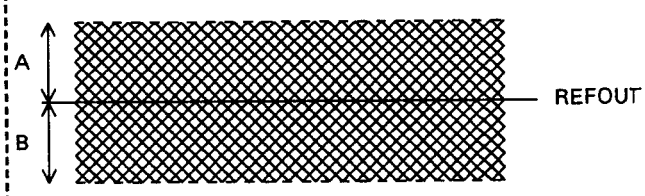


When using a multi-channel oscilloscope,do not connect the other negative probe to ground.

Fig. 33

Adjustment Procedure

1. Play tune TNO 12 in normal mode. (TYPE 3:TNO 14)
2. Use VR352 to adjust the RFO waveform so that REFOUT appears at the center. (A-B must not exceed 100 mV.)



10.6 TE Offset Adjustment-1

- Purpose: To adjust the electrical offset of the tracking servo to zero.
- Maladjustment symptoms: Search times too long,carriage run-away.

• Measuring equipment / jigs	• DC voltmeter
• Measuring point	• TEY
• Test disc and setting	• No Disc • Test mode
• Adjustment position	• VR353(TEO)

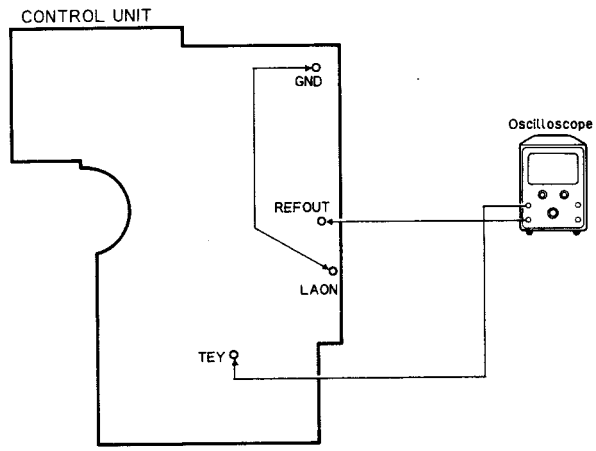


Fig. 34

Adjustment Procedure

1. Connect LAON to GND.
2. Switch regulator ON while in test mode.
3. Using VR353(TEO),adjust the TEY output DC voltage in reference to REFOUT to a value of 0±25mV.
4. Switch regulator OFF.

10.7 Tracking Balance Adjustment-1

- Purpose: To adjust the tracking servo offset to zero.
- Maladjustment symptoms: Search times too long,poor playability,carriage run-away.

• Measuring equipment / jigs	• Oscilloscope
• Measuring point	• TEY (Tracking error signal)
• Test disc and setting	• SONY TYPE 4 (or TYPE 3) • Test mode
• Adjustment position	• VR351(T.BAL)

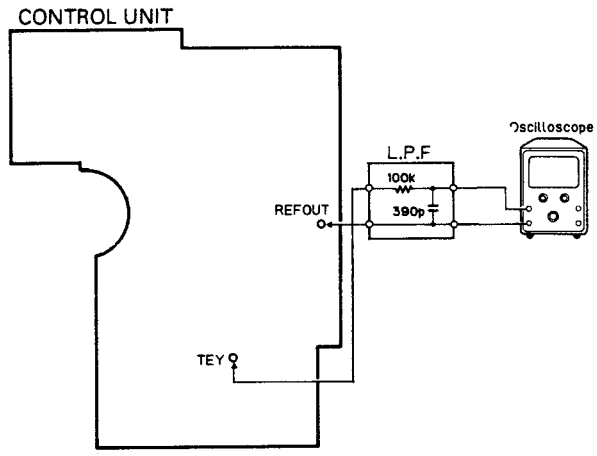
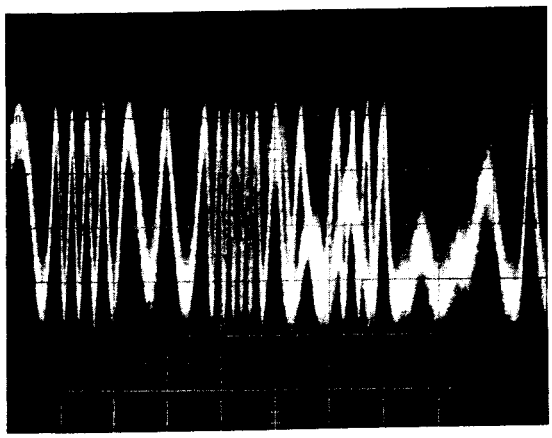


Fig. 35

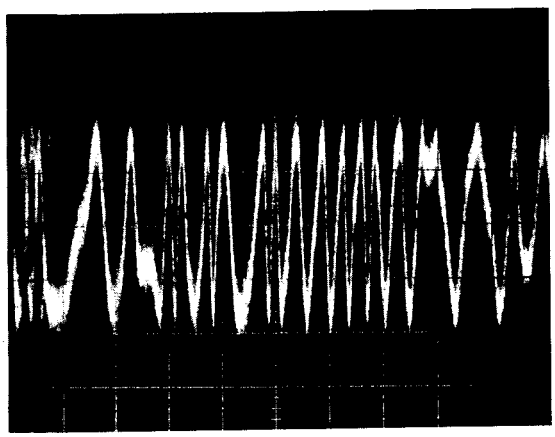
Adjustment Procedure

1. Set the test disc (SONY TYPE 4). Switch regulator ON.
2. Using the **TRACK+** or **TRACK-** key,move the pick-up to about the center of the signal surface.
3. Press the **B** key to close focus.
4. Using an oscilloscope,observe the TEY signal in respect to REFOUT.
   Then adjust VR351(T.BAL) to set the positive and negative amplitudes to the same levels.(See Fig.36-38)
5. Switch the power OFF.



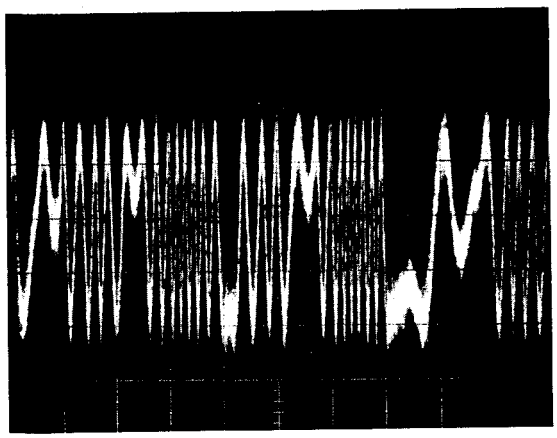
+5% NG

Fig. 36



±0% OK

Fig. 37



−5% NG

Fig. 38

10ms/div.
0.5V/div.
DC Mode

10.8 Focus Servo Loop Gain Adjustment

- Purpose: To adjust the focus servo loop gain to an optimum value.
- Maladjustment symptoms: Poor playability,reduced resistance to vibration,focus closure fails readily.

• Measuring equipment / jigs	• Oscillator,gain adjustment filter (GGF-065),dual meter milli-voltmeter
• Measuring point	• FEX,FEY
• Test disc and setting	• SONY TYPE 4 (or TYPE 3) • Normal mode
• Adjustment position	• VR356(FG)

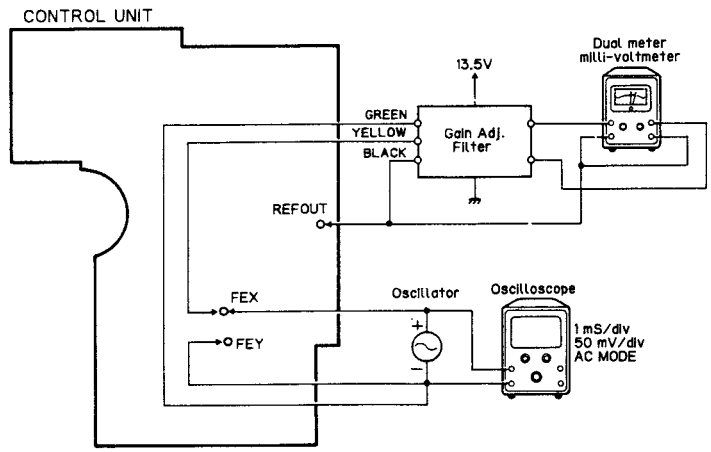


Fig. 39

Adjustment Procedure

1. After checking that the power is OFF, connect the gain adjustment filter and measuring equipment as shown in the above diagram.
2. Play tune TNO 12 in normal mode. (TYPE 3:TNO 14)
3. Set the oscillator to 1kHz,and observe the FEX/FEY output in the oscilloscope. Adjust the oscillator output to obtain a FEX/FEY output of 100mVp-p.
4. Adjust VR356(FG) to obtain a milli-voltmeter difference of 0±0.5dB.

10.9 Tracking Servo Loop Gain Adjustment

- Purpose: To adjust the tracking servo loop gain to an optimum value.
- Maladjustment symptoms: Poor playability,reduced resistance to vibration.

• Measuring equipment / jigs	• Oscillator,gain adjustment filter (GGF-065),dual meter milli- voltmeter
• Measuring point	• TEX,TEY
• Test disc and setting	• SONY TYPE 4 (or TYPE 3) • Normal mode
• Adjustment position	• VR354(TG)

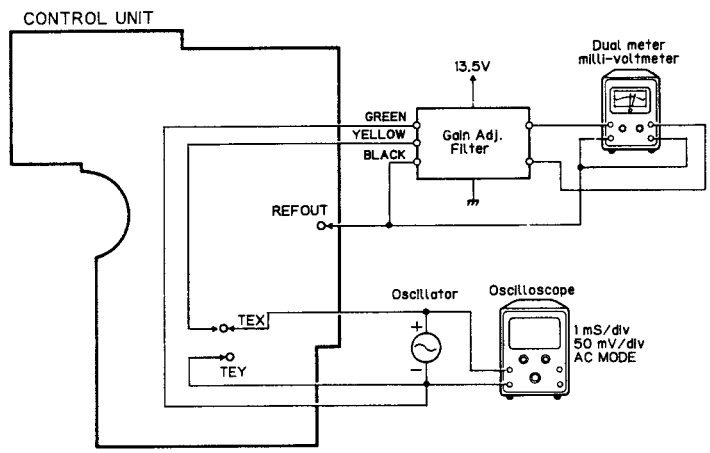


Fig. 40

Adjustment Procedure

1. After checking that the power is OFF, connect the gain adjustment filter and measuring equipment as shown in the above diagram.
2. Play tune TNO 12 in normal mode. (TYPE 3:TNO 14)
3. Set the oscillator to 1.4kHz,and observe the TEX/TEY output in the oscilloscope. Adjust the oscillator output to obtain a TEX/TEY output of 300mVp-p.
4. Adjust VR354(TG) to obtain a milli-voltmeter difference of 0±0.5dB.

10.10 TE Offset Adjustment-2

- Purpose: To adjust the electrical offset of the tracking servo to zero.
- Maladjustment symptoms: Search times too long,carriage run-away.

• Measuring equipment / jigs	• DC voltmeter
• Measuring point	• TEY
• Test disc and setting	• No Disc • Test mode
• Adjustment position	• VR353

Adjustment Procedure

Same as for TE offset adjustment-1,but with the DC voltage of the TEY output adjusted to 0±50mV.
The purpose of this additional adjustment is to correct any deviations generated when carrying out the tracking balance and tracking servo loop gain adjustments after completing TE offset adjustment-1.

10.11 Tracking Balance Adjustment-2

- Purpose: To adjust the tracking servo offset to zero.
- Maladjustment symptoms: Search times too long,poor playability,carriage run-away.

• Measuring equipment / jigs	• Oscilloscope
• Measuring point	• TEY
• Test disc and setting	• SONY TYPE 4 (or TYPE 3) • Test mode
• Adjustment position	• VR351

Adjustment Procedure

Steps 1 thru 5 same as tracking balance adjustment-1.

6. Check that the level difference between the positive and negative amplitudes of the TEY signal is within 5% (See Fig.36-38). If greater than 5%,adjust with VR351.
7. If further adjustment was necessary in step 6,repeat TE offset adjustment-2.

10.12 TUNER ADJUSTMENT

• Connection Diagram

NOTICE: Select C1 so that total capacity of 80pF attained from the direction of the receiver jack.
Z: Output impedance of SSG.

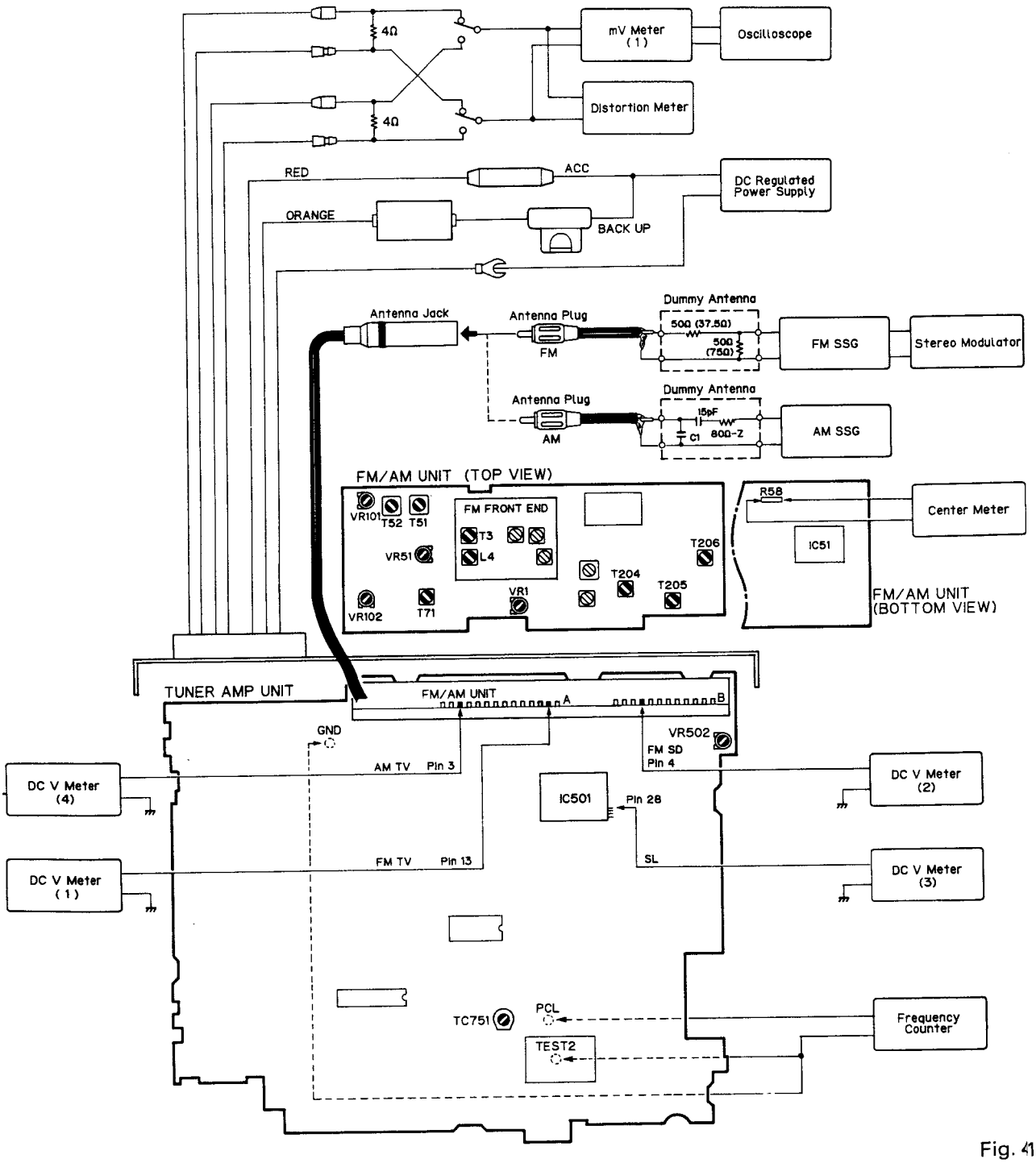


Fig. 41

FM ADJUSTMENT

※ Stereo MOD.: 1kHz, L+R=90% , Pilot=10%
*( ):US, UC Model

	No.	FM SSG(400Hz, 100%)		Displayed Frequency (MHz)	Adjusting Point	Adjustment Method (Switch Position)
		Frequency(MHz)	Level(dBf)			
Front End	1			108.0 *(107.9)	L4	DC V Meter(1):7.3±0.2V
	2			87.5 *(87.9)	—	Verify that DC V Meter(1) is more than 1.4±0.6V.
	3	98.1	10	98.1	T3	mV Meter(1):Maximum
IF	1	98.1025	65	98.1	T51	Center Meter:0
	2	98.1	65	98.1	T52	Distortion Meter:Minimum
	3	Repeat No.1-2 alternately so that the center meter indicates the 0 output and distortion meter indicates the minimum output.				
	4	98.1	13	98.1	T71	Oscilloscope :Optimum Symmetry
	5	※98.1	65	98.1	T71	Distortion Meter:Minimum (Rotate T71 less than ±90°)
Soft Mute	1	98.1	65	98.1	—	mV Meter(1): A dB (FM STEREO MODE)
	2	98.1	14	98.1	VR102	mV Meter(1): A-3 dB (FM STEREO MODE)
ARC	1	※98.1	39	98.1	VR101	mV Meter(1):Separation 5 dB (FM STEREO MODE)
SD	1	98.1	20	98.1	VR51	DC V Meter(2):Approx. 5V
	2	98.1	19	98.1	—	Verify that DC V Meter (2)is approx. 0V
	3	98.1	60	98.1	VR1	DC V Meter(2):Approx. 5V
	4	98.1	59	98.1	—	Verify that DC V Meter (2)is approx. 0V
RDS *1	1	98.1	35	98.1	VR502	DC V Meter(3):1.2±0.05V

*1:DEH-M980RDS/EW only

MW/LW ADJUSTMENT (EW model)

	No.	AM SSG(400Hz, 30%)		Displayed Frequency (kHz)	Adjusting Point	Adjustment Method (Switch Position)
		Frequency (kHz)	Level (dBμV)			
Tuning Volt	1	—	—	153	—	Verify that DC V Meter (4) is more than 2.0V.
	2	—	—	1,602	—	Verify that DC V Meter (4) is less than 6.5V.
	3	999	25	999	T204, 205, 206	mV Meter(1):Maximum

AM ADJUSTMENT (US, UC, ES model)

*( ):ES model when tuning step at 9kHz.

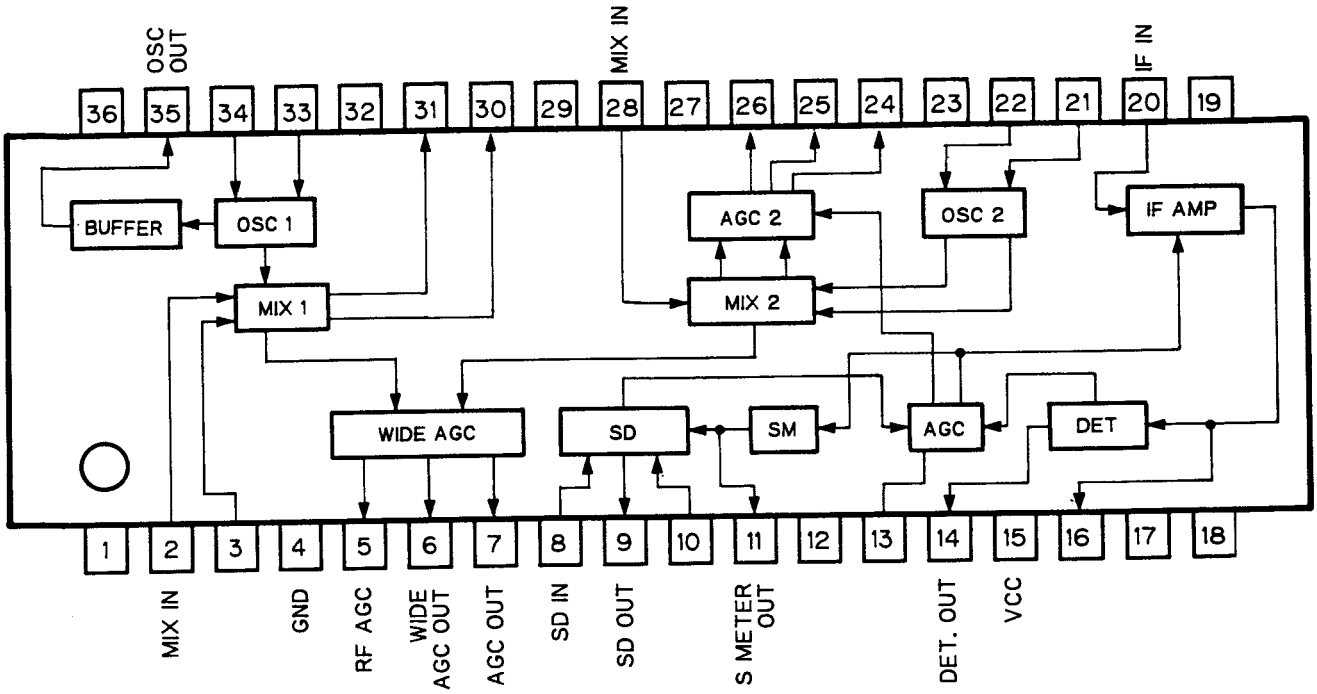
	No.	AM SSG(400Hz, 30%)		Displayed Frequency (kHz)	Adjusting Point	Adjustment Method (Switch Position)
		Frequency (kHz)	Level (dBμV)			
Tuning Volt	1			1,710 *(1,602)	—	Verify that DC V Meter (4) is less than 6.5V.
	2			530 *(531)	—	Verify that DC V Meter (4) is more than 2.0V.
IF	1	1,000 (999)	15	1,000 (999)	T204, 205, 206	mV Meter(1):Maximum

CLOCK ADJUSTMENT

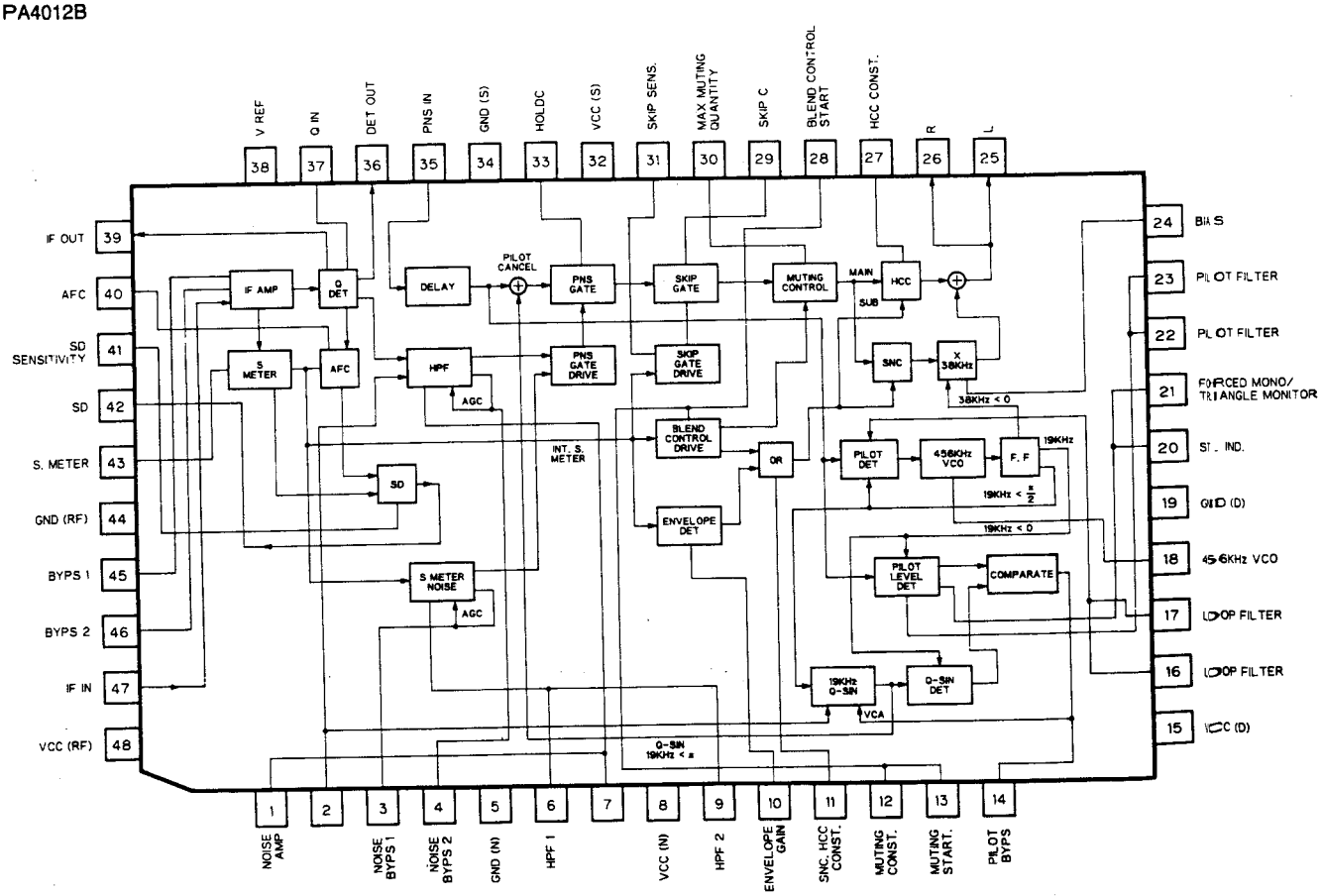
No.	Adjusting Point	Adjustment Method (Switch Position)
1		TEST2 connect to GND
2	TC751	Frequency Counter : 1.048576MHz±2Hz

• ICs

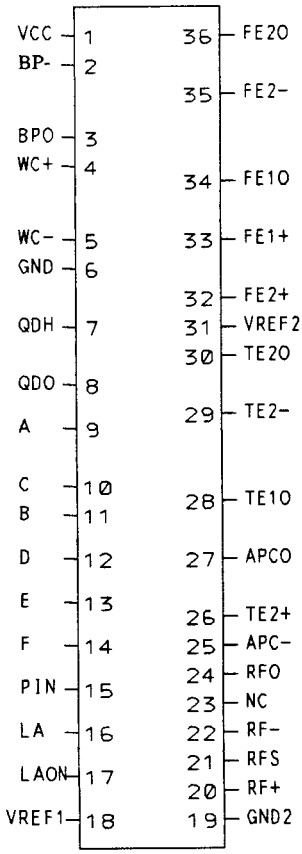
PA4018



PA4012B



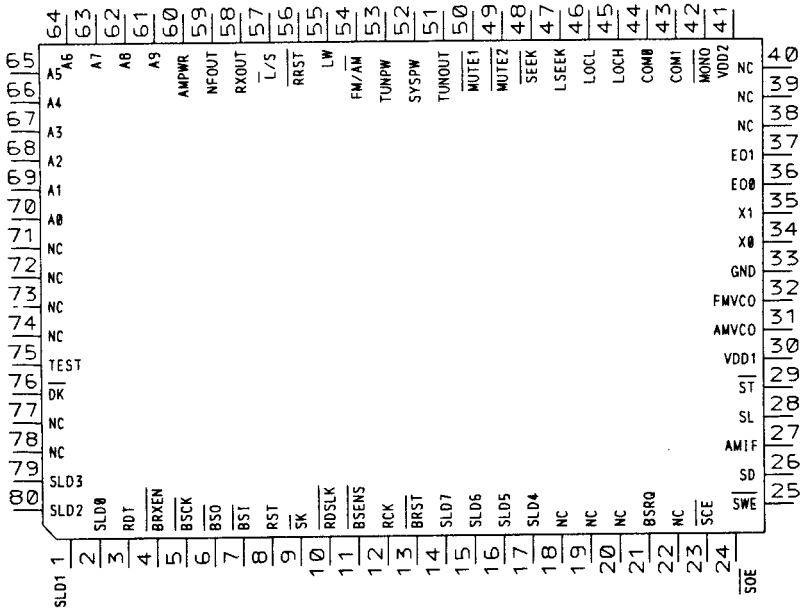
UPC1347GS



● Pin Functions(UPC1347GS)

Pin No	Pin Name	I/O	Function and Operation
1	VCC		
2	BP-	Input	Vibration detect amplifier 1 inverter input
3	BPO	Output	Vibration detect amplifier 1 output
4	WC+	Input	Window comparator non-inverting input
5	WC-	Input	Window comparator inverter input
6	GND		GND
7	QDH	Input	Vibration detect amplifier 3 non-inverting input
8	QDO	Output	Vibration detect amplifier 3 output
9	A	Input	A signal input
10	C	Input	C signal input
11	B	Input	B signal input
12	D	Input	D signal input
13	E	Input	E signal input
14	F	Input	F signal input
15	PIN	Input	APC circuit PD amplifier input
16	LA	Output	APC circuit LD amplifier output
17	LAON		Laser diode ON/OFF switching
18	VREF1		Reference voltage
19	GND2		GND
20	RF+	Input	RF amplifier non-inverting input
21	RFS	Output	RF summing virtual output
22	RF-	Input	RF amplifier inverter input
23	NC		
24	RFO	Output	RF amplifier output
25	APC-	Input	APC circuit PD amplifier inverter input
26	TE2+	Input	Tracking error amplifier 2 non-inverting input
27	APCO	Output	APC circuit PD amplifier output
28	TE1O	Output	Tracking error amplifier 1 output
29	TE2-	Input	Tracking error amplifier 2 inverter input
30	TE2O	Output	Tracking error amplifier 2 output
31	VREF2		Reference voltage
32	FE2+	Input	Focus error amplifier 2 non-inverting input
33	FE1+	Input	Focus error amplifier 1 non-inverting input
34	FE1O	Output	Focus error amplifier 1 output
35	FE2-	Input	Focus error amplifier 2 inverter input
36	FE2O	Output	Focus error amplifier 2 output

*GGF-919



*IC's marked by * are MOS type.*
Be careful handing them because they are very liable to be damaged by electrostatic induction.

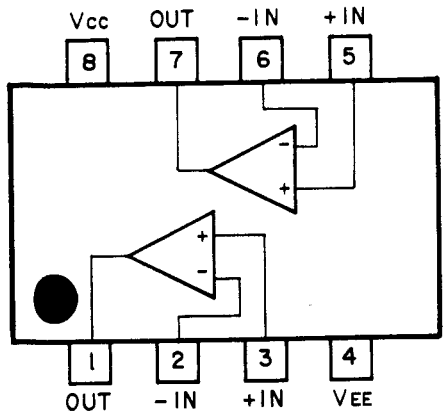
• Pin Functions (GGF-919)

Pin No.	Pin Name	I/O	I/O Format	Function and Operation
1, 2	SLD1, SLD0	I/O		SRAM data input/output pin
3	RDT	Input	N	Error correction data input pin
4	$\overline{\text{BRXEN}}$	I/O	N	Busy input pin
5	$\overline{\text{BSCK}}$	I/O		Serial clock input pin
6	$\overline{\text{BSO}}$	Input		Serial data Input pin
7	$\overline{\text{BSI}}$	Input		Serial data input pin
8	RST	Input		Data start input pin
9	$\overline{\text{SK}}$	Input		SK signal input pin
10	$\overline{\text{RDSLK}}$	Input		RDS signal lock input pin
11	$\overline{\text{BSENS}}$	Input		Back up power sense input pin
12	RCK	Input		Data clock input pin
13	$\overline{\text{BRST}}$	Input		Bus communication reset input pin
14 – 17	SLD7 – SLD4	I/O	C	SRAM data input/output pin
18 – 20	NC			Not used
21	BSRQ	Output	C	Bus communication service request output pin
22	NC			Not used
23	$\overline{\text{SCE}}$	Output	C	SRAM chip enable output pin
24	$\overline{\text{SOE}}$	Output	C	SRAM output enable output pin
25	$\overline{\text{SWE}}$	Output	C	SRAM read/write output pin "H":read, "L":write
26	SD	Input		SD signal input pin
27	AMIF	Input		AM IF input pin
28	SL	Input		Signal level input pin
29	$\overline{\text{ST}}$	Input		Stereo broadcast detection signal input pin
30	VDD1			Device power supply terminal
31	AMVCO	Input		AM VCO signal input pin
32	FMVCO	Input		FM VCO signal input pin
33	GND			GND
34	XO	Output		Crystal oscillating element connection pin

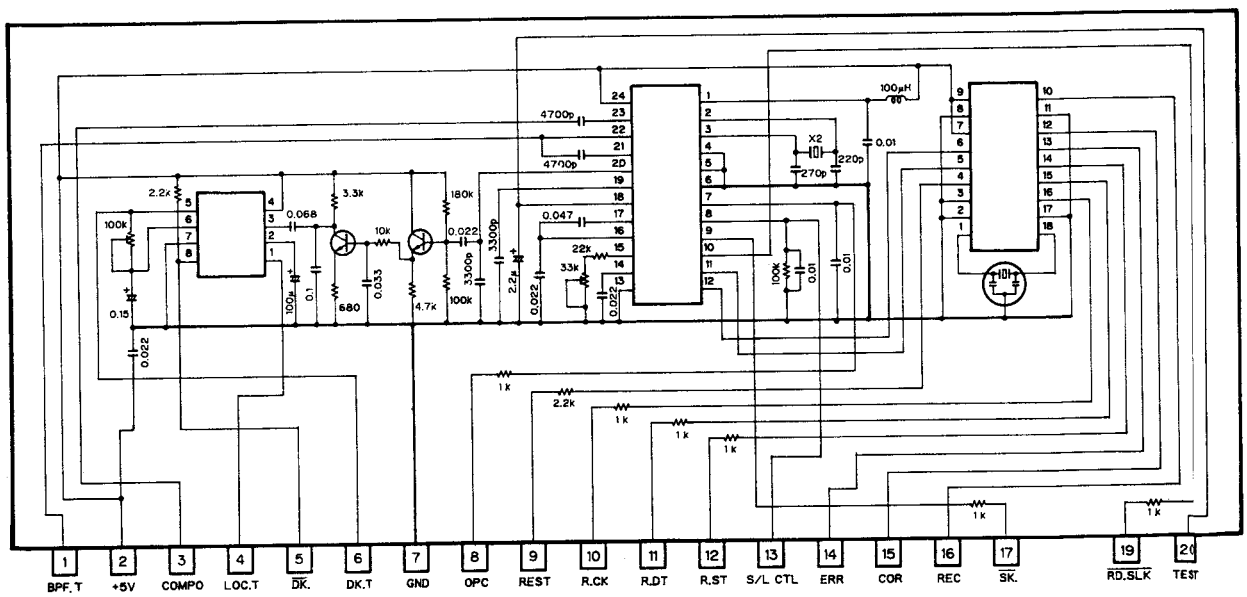
Pin No.	Pin Name	I/O	I/O Format	Function and Operation
35	XI	Input		Crystal oscillating element connection pin
36	E00	Output	C	PLL error output 0 pin
37	E01	Output	C	PLL error output 1 pin
38 – 40	NC			Not used
41	VDD2			Device power supply pin
42	$\overline{\text{MONO}}$	Output	C	Forced mono output pin
43, 44	NC			Not used
45	LOCH	Output	C	Local H setup output pin
46	LOCL	Output	C	Local L setup output pin
47	LSEEK	Output	C	Outputs high signal during BSM local SEEK operation.
48	$\overline{\text{SEEK}}$	Output	C	SEEK output pin Outputs low signal during SEEK operation.
49	$\overline{\text{MUTE2}}$	Output	C	Mute output when tuner/CD multi switching
50	$\overline{\text{MUTE1}}$	Output	C	Tuner mute output pin
51	TUNOUT	Output	C	Tuner/CD multi audio signal switching control pin "H":Tuner, "L":CD multi
52	SYSPW	Output	C	System power output pin
53	TUNPW	Output	C	Tuner power output pin
54	FM/$\overline{\text{AM}}$	Output	C	FM/AM power select output pin "H":FM, "L":AM
55	LW	Output	C	Loop filter switching output pin "H":LW
56	$\overline{\text{RRST}}$	Output	C	RDS data reset output pin
57	$\overline{\text{L}}$/S	Output	C	RDS decoder time constant select output pin
58	RXOUT	Output	C	RX output pin
59	NFOUT	Output	C	NF output pin
60	AMPWR	Output	C	"H" output when AM
61 – 70	A9 – A0	Output	C	SRAM address output pin
71 – 74	NC			Not used
75	TEST	Input	RDW	TEST mode input pin
76	$\overline{\text{DK}}$	Input	RDW	DK signal input pin
77, 78	NC			Not used
79, 80	SLD3, SLD2	I/O	C	SRAM data input/output pin

I/O Format	Meaning
C	CMOS Output
N	N channel open drain
RDW	With pull down resistor

M5218FP
RC4558M



CWV1020



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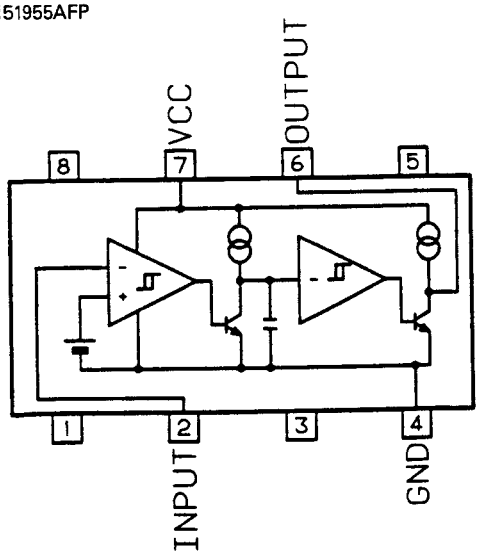
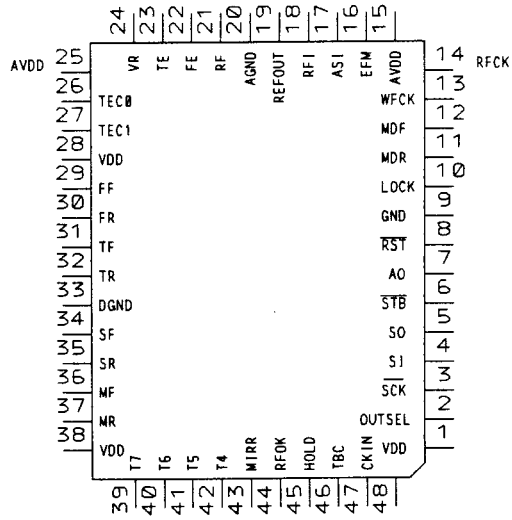


• Pin Functions (UPD6374GH)

Pin No	Pin Name	I/O	Function and Operation
1	VDD		Positive power supply terminal for logic circuit
2	OUTSEL	Input	Sets PWM output mode for the motor system
3	$\overline{SCK}$	Input	Clock input terminal for serial date input and output
4	SI	Input	Serial date input
5	SO	Output	serial date and status signal output
6	$\overline{STB}$	Input	Signal latching serial data inside LSI
7	A0	Input	Used in combination with $\overline{STB}$ A0 = "L" : Set in address register when $\overline{STB}$ is active A0 = "H" : Parameter setting when $\overline{STB}$ is active
8	$\overline{RST}$	Input	System reset
9	DGND		Logic circuit GND
10	LOCK	Input	Input terminals for detection of spindle servo error signals
11	MDR	Input	
12	MDF	Input	
13	WFCK	Input	
14	RFCK	Input	
15	AVDD		Positive power supply terminal for analog circuit
16	EFM	Output	EFM signal output terminal
17	ASI	Input	Level comparing input terminal for RF signal comparison
18	RFI	Input	Analog input terminal for EFM comparator
19	REFOUT	Output	A/D converter midpoint output terminal inside LSI
20	AGND		Analog circuit GND
21	RF	Output	RF signal input terminal
22	FE	Input	Focus error input terminal
23	TE	Input	Tracking error input terminal
24	VR	Input	Input signal is quantified as follows : Fs=88.2KHz, Resolution : 6 bits The output takes place directly at microcomputer interface, that is, not via the filter block within LSI.
25	AVDD		Positive power supply terminal for analog circuit
26	TECO	Input	Tracking comparator input terminal
27	TECI	Input	
28	DVDD		Positive power supply terminal for logic circuit
29	FF	Output	PWM positive output terminal for the focus loop filter
30	FR	Output	PWM negative output terminal for the focus loop filter
31	TF	Output	PWM positive output terminal for the tracking loop filter
32	TR	Output	PWM negative output terminal for the tracking loop filter
33	DGND		Logic circuit GND terminal
34	SF	Output	PWM positive output terminal for the thread loop filter
35	SR	Output	PWM negative output terminal for the thread loop filter
36	MF	Output	PWM positive output terminal for the spindle loop filter
37	MR	Output	PWM negative output terminal for the spindle loop filter
38	DVDD		Positive power supply terminal for logic circuit
39	T7	Input	Sets tracking PWM output mode
40	T6	Input	Sets focus PWM output mode
41	T5	Input	Selects motor modulation mode
42	T4	Input	Selects between focus and tracking modulation modes
43	MIRR	Output	MIRR detection signal output terminal
44	RFOK	Output	RFOK detection signal output terminal
45	HOLD	Input	Hold control signal input terminal
46	TBC		Tracking bank switching terminal
47	CKIN	Input	System clock input terminal
48	$\overline{TEST}$	Input	Test terminal

UPD6374GH



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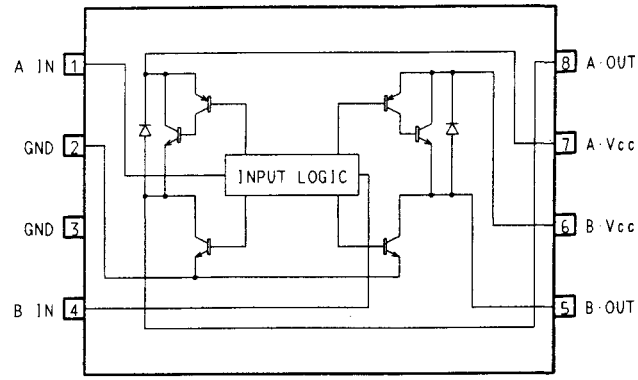
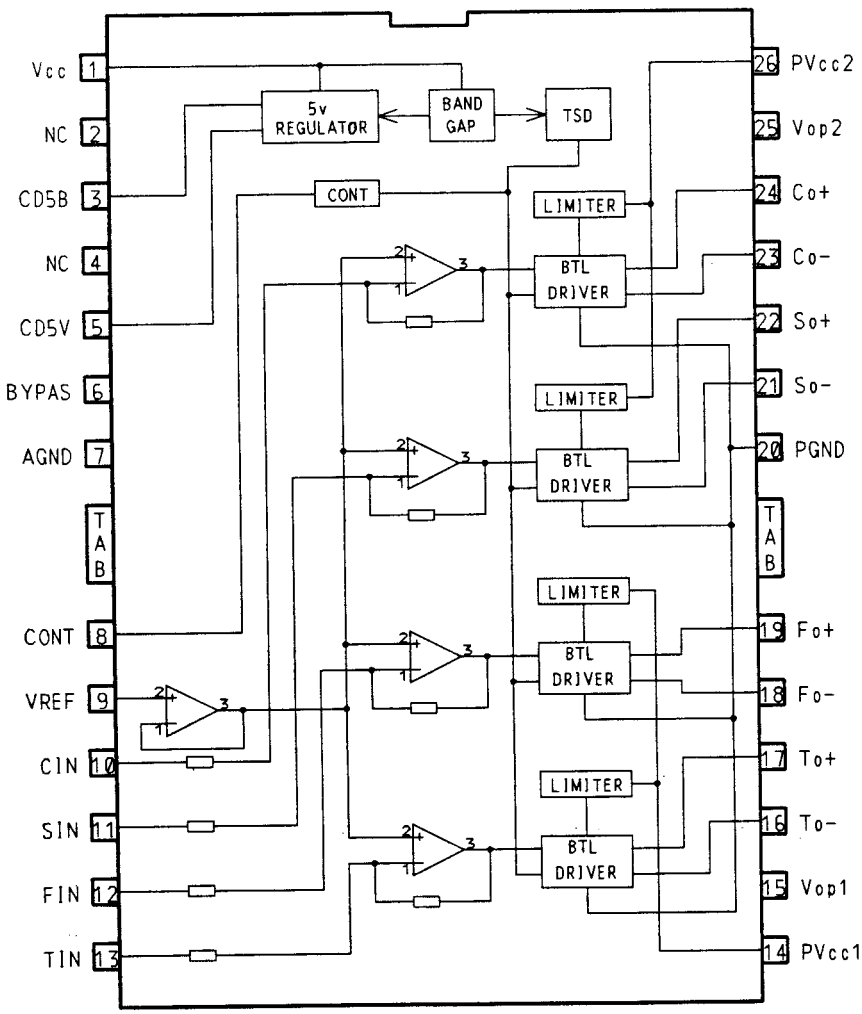


PA3026

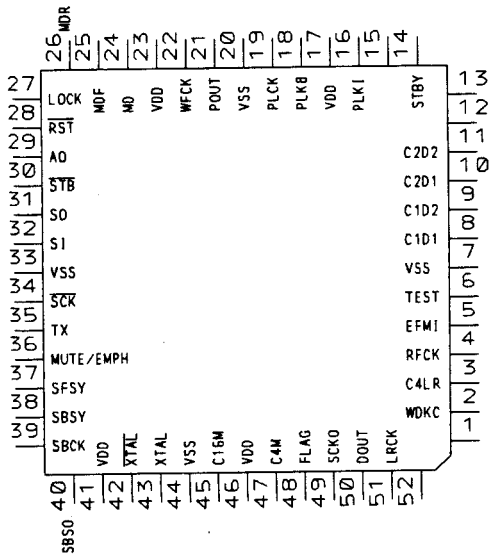


• Pin Functions (UPD6375GC)

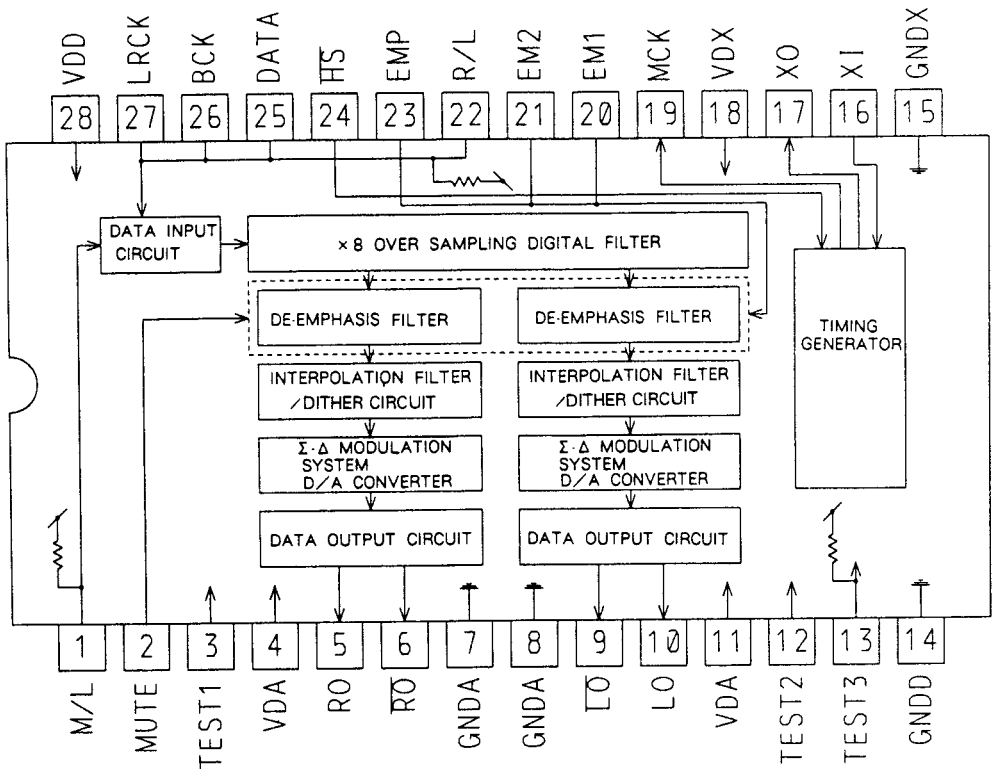
Pin No	Pin Name	I/O	Function and Operation
1	NC		
2	WDCK	Output	Output terminal for signal having double the frequency of LRCK
3	C4LR	Output	Output terminal for signal having four the frequency of LRCK
4	RFCK	Output	Oscillation clock divider signal, output terminal for signal giving one-frame synchronization
5	EFMI	Input	EFM signal input terminal
6	TEST		TEST
7	VSS		GND
8	C1D1	Output	Output terminal indicating C1 error correction status
9	C1D2	Output	
10	C2D1	Output	Output terminal indicating C2 error correction status
11	C2D2	Output	
12, 13	NC		
14	STBY	Input	Standby input terminal. STBY=H stops clock oscillation
15	NC		
16	PLK1	Output	VCO output terminal for use in analog PLL selection
17	VDD		VDD
18	PLK8	Input	VCO clock input terminal for use in analog PLL selection
19	PLCK	Output	Bit clock monitor terminal
20	VSS		GND
21	POUT	Output	Output terminal for phase comparison between EFM signal and bit clock
22	WFCK	Output	Signal issuring one-frame period (approximately 7.35kHz) by bit clock dividing signal
23	VDD		5 V
24	MD	Output	Signal indicating spindle motor CLV servo control output status
25	MDF	Output	Spindle motor CLV servo control positive direction output terminal
26	MDR	Output	Spindle motor CLV servo control negative direction output terminal
27	LOCK	Output	Becomes "H" when the synchronization signal and frame counter output coincide at EFM demodulator
28	$\overline{RST}$	Input	Reset signal input terminal
29	A0	Input	Control signal distinguishing data from microcomputer
30	$\overline{STB}$	Input	Signal latching within this LSI the serial data fetched from SI terminal
31	SO		Serial data input terminal
32	SI	Input	Input terminal fro data from microcomputer
33	VSS		GND
34	$\overline{SCK}$	Input	Clock input terminal for serial data input
35	TX	Output	Digital audio interface data output terminal
36	MUTE/EMPH	Output	Output terminal for mute command decoding signal or sub-Q command pre-emphasis data
37	SFSY	Output	Signal indicating subcode one-frame synchronization
38	SBSY	Output	Signal indicating head of subcode block
39	SBCK	Input	Subcode data read clock input terminal
40	SBSO	Output	Subcode data output terminal
41	VDD		5 V
42	$\overline{XTAL}$	Output	Oscillation continuation terminal
43	XTAL	Input	Oscillation continuation terminal

Pin No	Pin Name	I/O	Function and Operation
44	VSS		GND
45	C16M	Output	Oscillation clock output terminal
46	VDD		5 V
47	C4M	Output	1/4 cycle output terminal for oscillation clock signals
48	FLAG	Output	Flag signal indicating that the current audio data output consists of incorrectable data
49	SCKO	Output	Clock output terminal for audio serial data
50	DOUT	Output	Serial audio data output terminal
51	LRCK	Output	Signal distinguishing between left and right channel DOUT terminal output
52	NC		

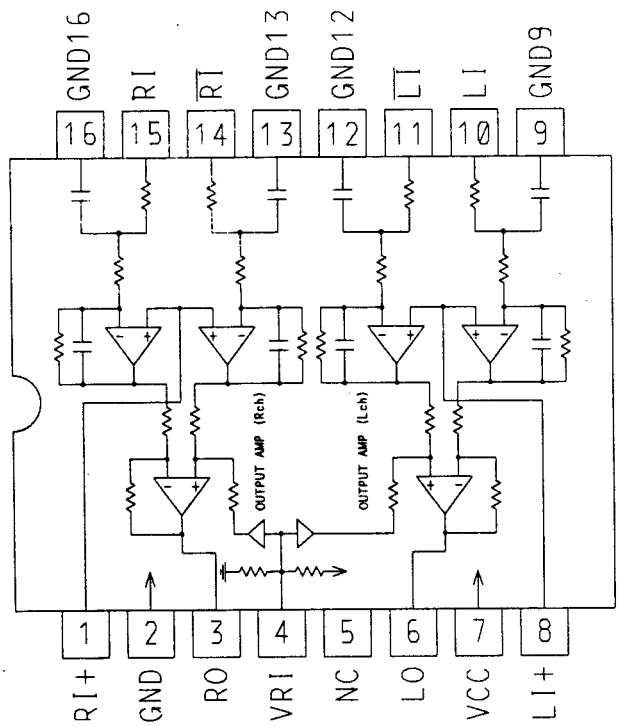
UPD6375GC



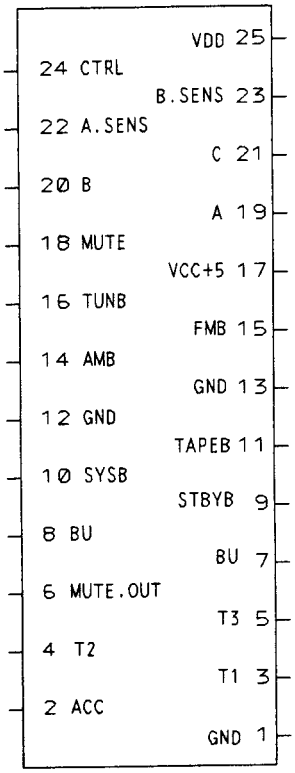
TC9237F



TA2009F



PA2019A



• Pin Function (PA2019A)

Pin No.	Pin Name	I/O	Function and Operation
1	GND(REF)		Reference ground
2	ACC		ACC
3	T1		Connects external condenser for VDD back-up
4, 5	NC		
6	MUTEOUT	Output	Mute circuit control output
7, 8	BU		Back-up
9	STBY B	Output	Power amplifier control signal output
10	SYSB	Output	Stabilized power output for common system circuits such as for tone quality , volume , and balance
11	TAPEB	Output	Stabilized power output for cassette deck circuits such as for the equalizer amplifier
12, 13	GND(A)		Analog ground
14	AMB	Output	Stabilized power output for AM tuner circuit
15	FMB	Output	Stabilized power output for FM tuner circuit
16	TUNB	Output	Stabilized power output for AM and FM tuner external circuit
17	VCC 5V	Output	Stabilized power output for microcomputer interface and other circuit
18	MUTE	Input	Mute signal input
19	A	Input	Output selection input controlling output by the 3-bit ABC signal
20	B	Input	Output selection input controlling output by the 3-bit ABC signal
21	C	Input	Output selection input controlling output by the 3-bit ABC signal
22	ASENS	Output	ACC line voltage detection output(H for output detection)
23	BSENS	Output	BU line voltage detection output(H for output detection)
24	CTRL	Input	IC status control input for control from outside
25	VDD 5V		Stabilized power source for microcomputer has backup function

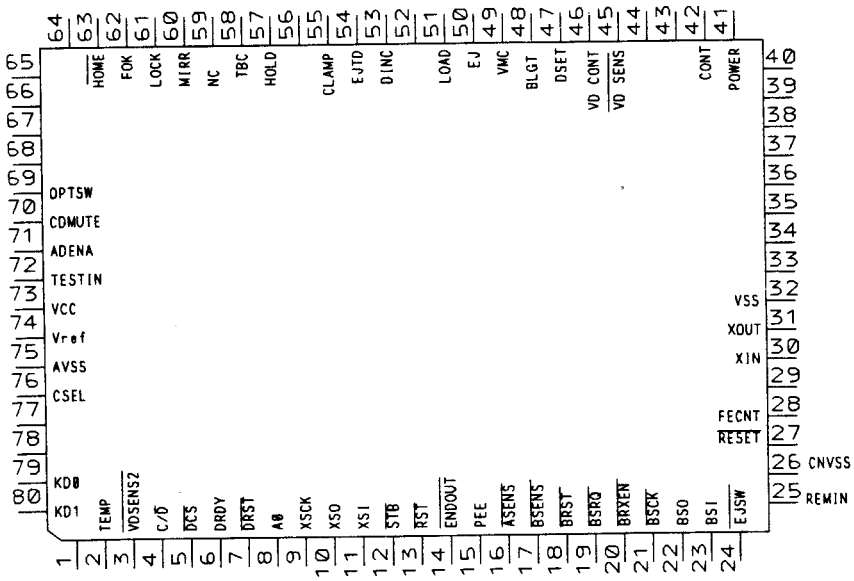
• Pin Functions (PD5156C)

Pin No.	Pin Name	I/O	I/O Format	Function and Operation
1	NC			Not used
2	TEMP			Temperature detector
3	$\overline{\text{VDSENSE2}}$			Short sense input
4	DCD	Output	NM	Command/data appointment output
5	$\overline{\text{DCS}}$	Output	NM	Chip select output
6	DRDY	Input		Ready input
7	$\overline{\text{DRST}}$	Output	NM	Reset output
8	A0	Output	NM	LSI data control signal
9	XSCK	Output	NM	LSI clock output
10	XSO	Output	NM	LSI data output
11	XSI	Input	NM	LSI data input
12	$\overline{\text{STB}}$	Output	C	LSI strobe output
13	$\overline{\text{RST}}$	Output	C	Reset output pin
14	$\overline{\text{ENDOUT}}$	Output	C	Digital output enable signal
15	PEE	Output	C	Beep tone output
16	$\overline{\text{ASENS}}$	Input		ACC power sense input pin
17	$\overline{\text{BSENS}}$	Input		Back up power sense input pin
18	$\overline{\text{BRST}}$	Input		Bus communication reset input pin
19	$\overline{\text{BSRQ}}$	Output	C	Bus communication service request output pin
20	$\overline{\text{BRXEN}}$	Input/ Output	C	Bus communication reception enable input pin
21	$\overline{\text{BSCK}}$	Input/ Output	C	Bus serial clock input/output
22	BSO	Output	C	Serial data output pin
23	BSI	Input		Bus serial data input
24	$\overline{\text{EJSW}}$	Input		Eject signal input
25	REMIN	Input		Remote control pulse input
26	CNVSS			Gnd
27	$\overline{\text{RESET}}$	Input		Reset input
28	FECNT	Output	C	
29	NC			Not used
30	XIN	Input		Crystal oscillating element connection pin
31	XOUT	Output	C	Crystal oscillating element connection pin
32	VSS			GND
33 – 40	NC			Not used
41	POWER	Output	C	CD +5V control
42	CONT	Output	C	Servo driver power supply control
43, 44	NC			Not used
45	$\overline{\text{VDSENS}}$	Input		Over voltage sense input
46	VDCONT	Output	C	VD control output
47	DSET	Output	C	Disc set indicator control output
48	BLGT	Output	C	LCD back light control output
49	VMC	Output	C	Loading motor driver power supply
50	EJ	Output	C	Loading motor EJECT control
51	LOAD	Output	C	Loading motor LOAD control
52	NC			Not used
53	DINC	Input		Disc insert sense input
54	EJTD	Input		Disc eject position sense input "H":FM, "L":AM
55	CLAMP	Input		Disc clamp sense input
56	NC			Not used

Pin No.	Pin Name	I/O	I/O Format	Function and Operation
57	HOLD	Output	C	Hold control output
58	TBC	Output	C	Tracking bank switching output
59	NC			Not used
60	MIRR	Input		Mirror detector input
61	LOCK	Input		Spindle lock detector input
62	FOK	Input		FOK signal input
63	$\overline{\text{HOME}}$	Input		Home position detector input
64-68	NC			Not used
69	OPTSW	Input		Digital output ON/OFF input
70	CDMUTE	Output	C	CD mute output
71	ADENA	Output	C	A/D reference voltage output
72	TESTIN	Input		Test program mode input
73	VCC			Back up 5V
74	VREF	Input		A/D reference voltage input
75	AVSS			A/D GND
76	CSEL			Compression select
77, 78	NC			Not used
79	KD0			Analog key input 0
80	KD1			Analog key input 1

I/O Format	Meaning
C	CMOS output
NM	Middle resistivity N channel open drain

*PD5156C

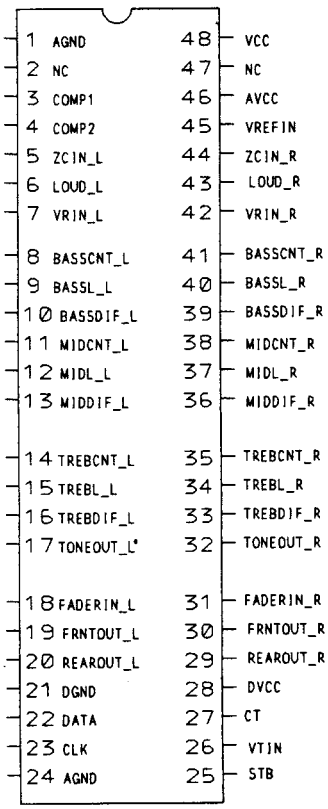


• Pin Function (PMJ001A)

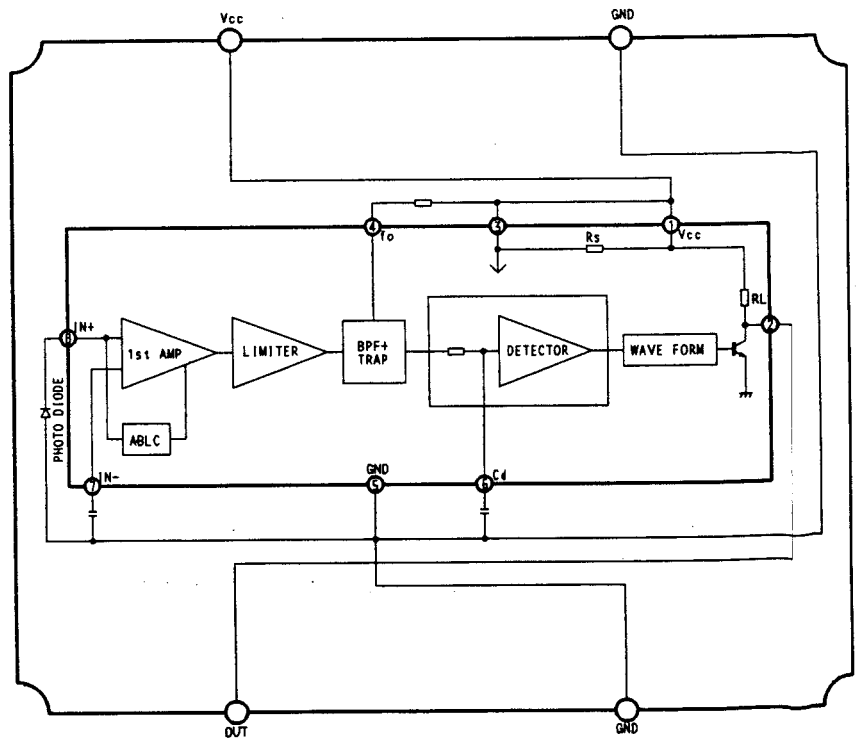
Pin No	Pin Name	I/O	Function and Operation
1	AGND		Analog GND
2	NC		Non connect
3	COMP1		Reference voltage circuit, phase compensation terminal 1
4	COMP2		Reference voltage circuit, phase compensation terminal 2
5	ZCIN_L	Input	Lch:Zero cross detection circuit input
6	LOUD_L		Lch:Loudness setting terminal
7	VRIN_L	Input	Lch:Input. Hot side of volume
8	BASSCNT_L		Lch:Low frequency control terminal
9	BASSL_L		Lch:Pseudo inductor terminal for low frequencies
10	BASSDIF_L		Lch:Pseudo inductor differential input terminal for low frequencies
11	MIDCNT_L		Lch:Medium frequency control terminal
12	MIDL_L		Lch:Pseudo inductor terminal for medium frequencies
13	MIDDIF_L		Lch:Pseudo inductor differential input terminal for medium frequencies
14	TREBCNT_L		Lch:High frequency control terminal
15	TREBL_L		Lch:Pseudo inductor terminal for high frequencies
16	TREBDIF_L		Lch:Pseudo inductor differential input terminal for high frequencies
17	TONEOUT_L	Output	Lch:Buffer output terminal for the tone control circuit
18	FADERIN_L	Input	Lch:Fader circuit input terminal
19	FRNTOUT_L	Output	Lch:Front buffer output circuit
20	REAROUT_L	Output	Lch:Rear buffer output circuit
21	DGND		Digital GND terminal
22	DATA	Input	Serial data input terminal
23	CLK	Input	Clock input terminal
24	AGND		Analog GND
25	STB	Input	Latch strobe input terminal
26	VTIN	Input	Applies half of digital control power source controlling this IC
27	CT		Time constant terminal for forced switching time setting till zero cross detection
28	DVCC	Input	Digital power source terminal
29	REAROUT_R	Output	Rch:Rear buffer output circuit
30	FRNTOUT_R	Output	Lch:Front buffer output circuit
31	FADERIN_R	Input	Rch:Fader circuit input terminal
32	TONEOUT_R	Output	Rch:Buffer output terminal for the tone control circuit
33	TREBDIF_R		Rch:Pseudo inductor differential input terminal for high frequencies
34	TREBL_R		Rch:Pseudo inductor terminal for high frequencies
35	TREBCNT_R		Rch:High frequency control terminal
36	MIDDIF_R		Rch:Pseudo inductor differential input terminal for low frequencies
37	MIDL_R		Rch:Pseudo inductor terminal for medium frequencies
38	MIDCNT_R		Rch:Medium frequency control terminal
39	BASSDIF_R		Rch:Pseudo inductor differential input terminal for low frequencies
40	BASSL_R		Rch:Pseudo inductor terminal for low frequencies
41	BASSCNT_R		Rch:Low frequency control terminal
42	VRIN_R	Input	Rch:Input. Hot side of volume
43	LOUD_R		Rch:Loudness setting terminal
44	ZCIN_R	Input	Rch:Zero cross detection circuit input

Pin No	Pin Name	I/O	Function and Operation
45	VREFIN	Input	Reference voltage input terminal
46	AVCC	Output	Internal stabilized power source terminal
47	NC		
48	VCC		Power terminal

PMJ001A



RS-20C



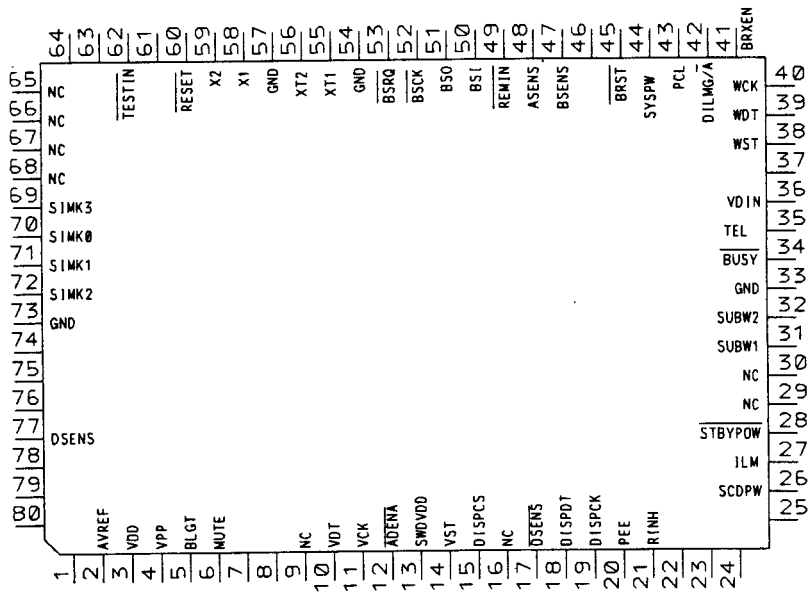
• Pin Functions (PD4348C)

Pin No.	Pin Name	I/O	I/O Format	Function and Operation
1	NC	Input		GND
2	AVREF	Input		A/D converter reference voltage input
3	VDD			VDD
4	VDD			PROM write power supply
5	BLGT	Output	C	Back light control output
6	MUTE	Output	C	System mute ON/OFF output
7-9	NC	Output	C	Open
10	VDT	Output	C	Electrical volume data output
11	VCK	Output	C	Electrical volume clock output
12	$\overline{\text{ADENA}}$	Output	C	AVREF enable output
13	SWVDD	Output	C	Key micro computer power supply control output
14	VST	Output	C	Electrical volume strobe output
15	DISPCS	Output	C	Key/display micro computer chip select output
16	NC	Output	C	Open
17	NC	Input		Connect to VDD
18	DISPDT	Output	C	Key/display micro computer data output
19	$\overline{\text{DISPCK}}$	Output	C	Key/display micro computer clock output
20	PEE	Output	C	Beep tone output
21-25	NC	Input		Connect to GND
26	SCDPW	Output	C	S-CD ON/$\overline{\text{OFF}}$ output
27	ILM	Output	C	Illumination control output
28	$\overline{\text{STBYPW}}$	Output	C	Power supply IC control
29, 30	NC	Output	NM	Open
31	SUBW1	Output	NM	Sub woofer frequency switching multiplexer control output 1
32	SUBW2	Output	NM	Sub woofer frequency switching multiplexer control output 2
33	GND			
34	$\overline{\text{BUSY}}$	Input		Key/display micro computer BUSY input
35	TEL	Input		TEL mute ON/$\overline{\text{OFF}}$ input
36	VDIN	Input		VD sense input
37	NC	Input		
38	WST	Output	C	Sub woofer electrical volume strobe output
39	WDT	Output	C	Sub woofer electrical volume data output
40	WCK	Output	C	Sub woofer electrical volume clock output
41	BRXEN			Bus reception enable line
42	DIMLG/$\overline{\text{A}}$	Output	C	Dual illumination green/$\overline{\text{amber}}$ output
43	PCL	Output	C	Clock adjustment output
44	SYSPW	Output	C	System power supply control output
45	$\overline{\text{BRST}}$	Output	C	Reset output
46	NC	Input		
47	BSENS	Input		Back-up sense input
48	ASENS	Input		ACC sense input
49	$\overline{\text{REMIN}}$	Input		Key micro computer signal input
50	BSI	Input		BUS serial data input
51	BSO	Output		BUS serial data output
52	$\overline{\text{BSCK}}$			Serial data clock input/output
53	BSRQ	Input		Polling request input
54	GND			
55	XT1			Connect to GND
56	XT2			NC

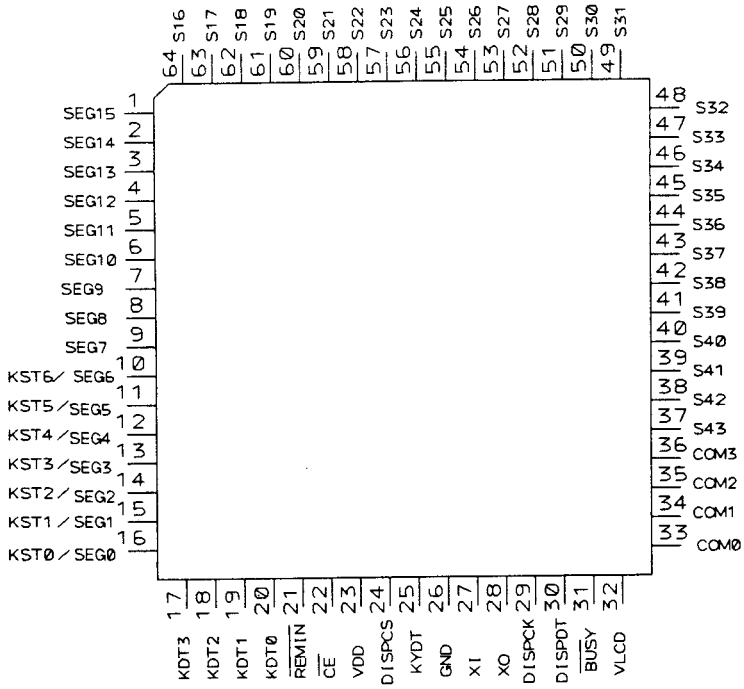
Pin No.	Pin Name	I/O	I/O Format	Function and Operation
57	IC			Connect to GND
58	X1			Oscillator
59	X2			Oscillator
60	$\overline{\text{RESET}}$	Input		Reset input
61	NC	Input		
62	$\overline{\text{TESTIN}}$	Input		Test mode
63, 64	NC	Input		Connect to GND
65-67	NC	Output	NM	Open
68	NC	Output	NM	Reset
69	SIMK3	Input		Model select input 3
70	SIMK0	Input		Model select input 0
71	SIMK1	Input		Model select input 1
72	SIMK2	Input		Model select input 2
73-76	AGND			Connect to GND
77	DSENS	Input		Front panel EJECT/REPLACE sensor input
78-80	NC			Connect to GND

I/O Format	Meaning
C	CMOS. output
NM	Middle resistivity N channel open drain

*PD4348C



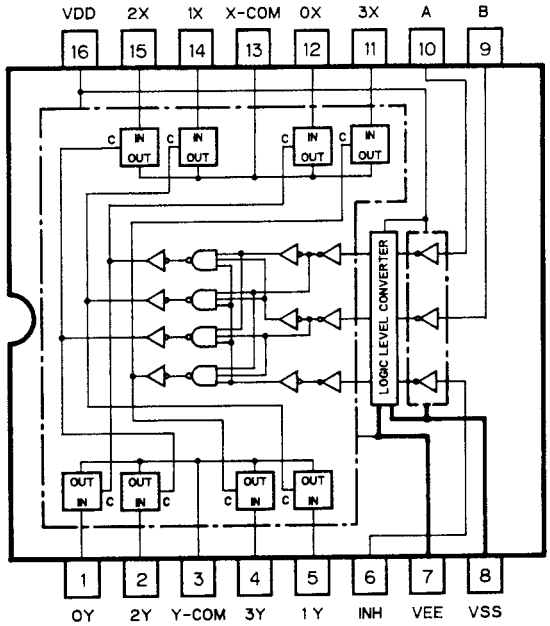
*GGF-921



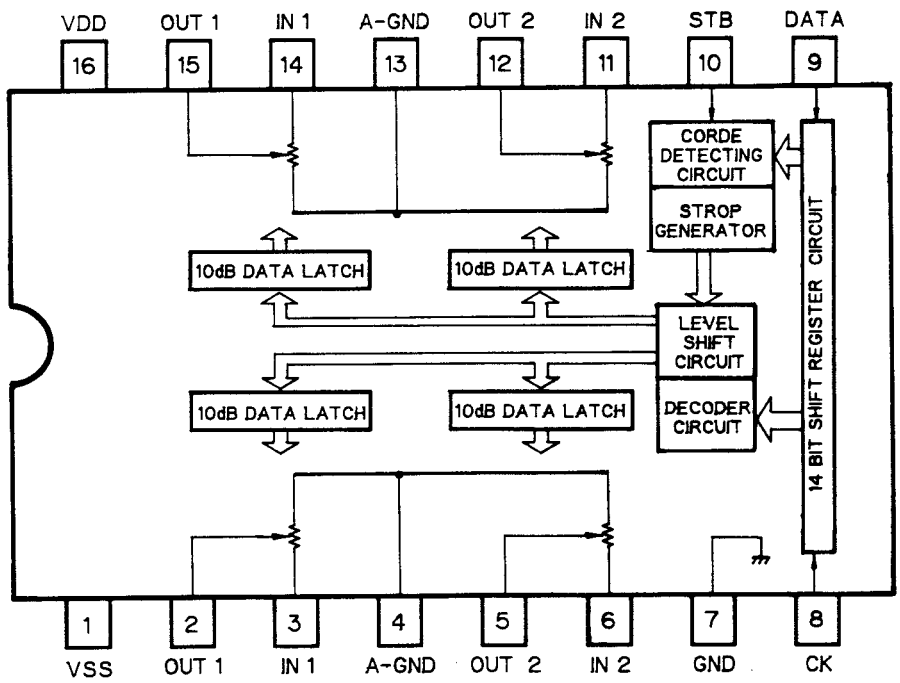
• Pin Functions (GGF-921)

Pin No.	Pin Name	I/O	I/O Format	Function and Operation
1—9	SEG15 – 7	Output		LCD segment output
10 | 16	KST6/SEG6 | KST0/SEG0	Output		Key strobe/LCD segment output
17—20	KDT3-KDT0	Input		Key data input
21	$\overline{\text{REMIN}}$	Input		Remote control signal input
22	$\overline{\text{CE}}$			Device select input(Reset)
23	VDD			
24	DISPCS	Input		Display data communication chip select
25	KYDT	Output		Remote control data output
26	GND			
27, 28	XI, XO			Crystal oscillating element connection pin
29	DISPCK	Input		Display data communication clock input
30	DISPDT	Input		Display data communication data input
31	$\overline{\text{BUSY}}$	Output		Display data communication BUSY output
32	VLCD			Power supply for LCD
33—36	COM0—COM3			Common output
37—64	S43—S16	Output		LCD segment output

TC4052BF



TC9213P

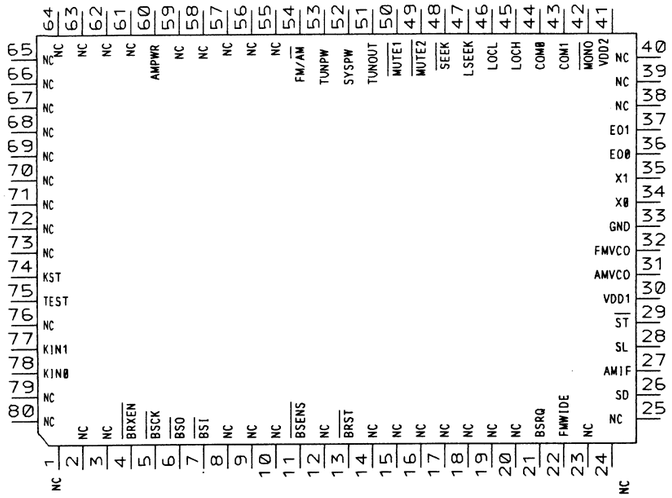


• Pin Functions (GGF-927)

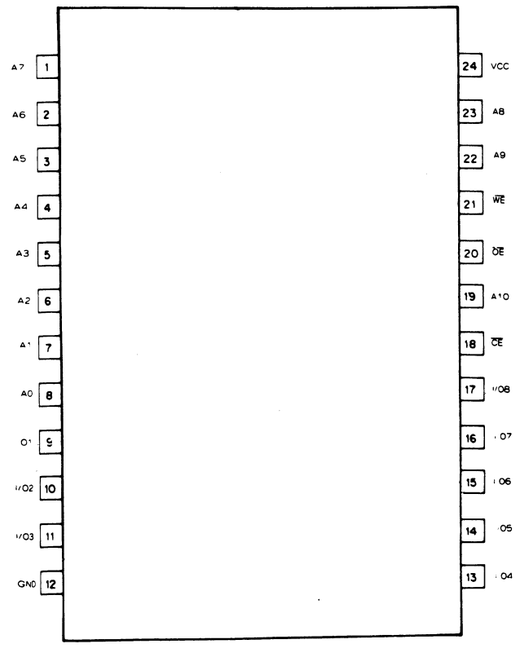
Pin No.	Pin Name	I/O	I/O Format	Function and Operation
1—3	NC			Not used
4	$\overline{\text{BRXEN}}$	I/O	N	Busy input pin
5	$\overline{\text{BSCK}}$	I/O		Serial clock input pin
6	$\overline{\text{BSO}}$	Input		Serial data Input pin
7	$\overline{\text{BSI}}$	Input		Serial data input pin
8—10	NC			Not used
11	$\overline{\text{BSENS}}$	Input		Back up power sense input pin
12	NC			Not used
13	$\overline{\text{BRST}}$	Input		Bus communication reset input pin
14—20	NC			Not used
21	BSRQ	Output	C	Bus communication service request output pin
22	FMWIDE	Output	C	FM wide output pin
23—25	NC			Not used
26	SD	Input		SD signal input pin
27	AMIF	Input		AM IF input pin
28	SL	Input		Signal level input pin
29	$\overline{\text{ST}}$	Input		Stereo broadcast detection signal input pin
30	VDD1			Device power supply terminal
31	AMVCO	Input		AM VCO signal input pin
32	FMVCO	Input		FM VCO signal input pin
33	GND			GND
34	XO	Output		Crystal oscillating element connection pin
35	XI	Input		Crystal oscillating element connection pin
36	EO0	Output	C	PLL error output 0 pin
37	EO1	Output	C	PLL error output 1 pin
38—40	NC			Not used
41	VDD2			Device power supply pin
42	$\overline{\text{MONO}}$	Output	C	Forced mono output pin
43, 44	NC			Not used
45	LOCH	Output	C	Local H setup output pin
46	LOCL	Output	C	Local L setup output pin
47	LSEEK	Output	C	Outputs high signal during BSM local SEEK operation.
48	$\overline{\text{SEEK}}$	Output	C	SEEK output pin Outputs low signal during SEEK operation.
49	$\overline{\text{MUTE2}}$	Output	C	Mute output when tuner/CD multi switching
50	$\overline{\text{MUTE1}}$	Output	C	Tuner mute output pin
51	TUNOUT	Output	C	Tuner/CD multi audio signal switching control pin "H":Tuner, "L":CD multi
52	SYSPW	Output	C	System power output pin
53	TUNPW	Output	C	Tuner power output pin
54	FM/$\overline{\text{AM}}$	Output	C	FM/AM power select output pin "H":FM, "L":AM
55—59	NC			Not used
60	AMPWR	Output	C	"H" output when AM
61—73	NC			Not used
74	KST	Output	C	Strobe output pin
75	TEST	Input	RDW	TEST mode input pin
76	NC			Not used
77	KIN1	Input	RDW	Return input 1
78	KIN0	Input	RDW	Return input 0
79, 80	NC			Not used

I/O Format	Meaning
C	CMOS output
N	N channel open drain
RDW	With pull down resistor

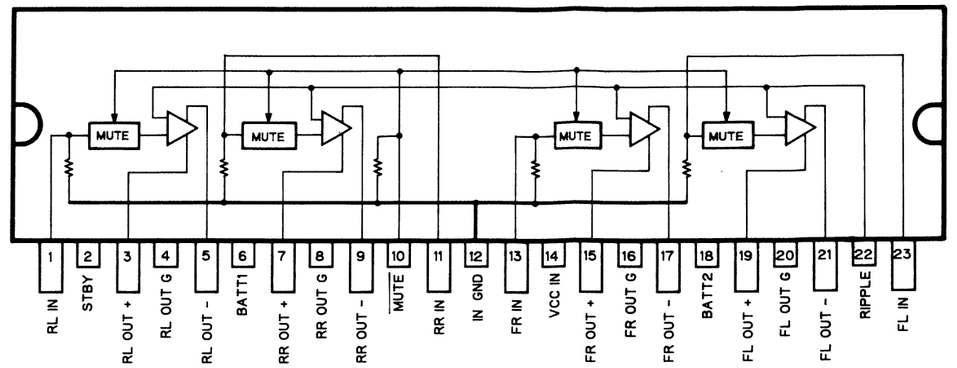
*GGF-927



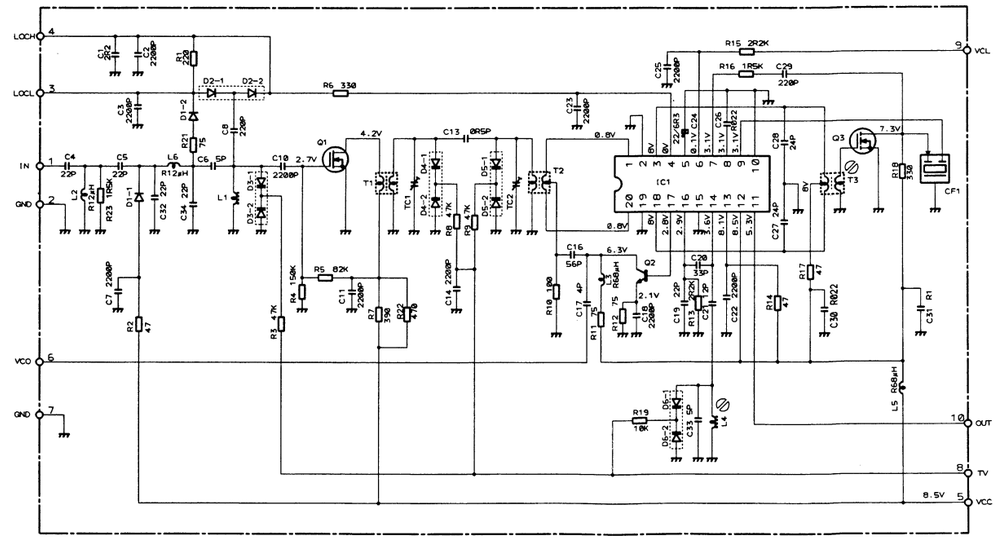
LH5116HN-10T



PA3027A



• FM Front End (CWB1063, CWB1064)



NOTE:

Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.

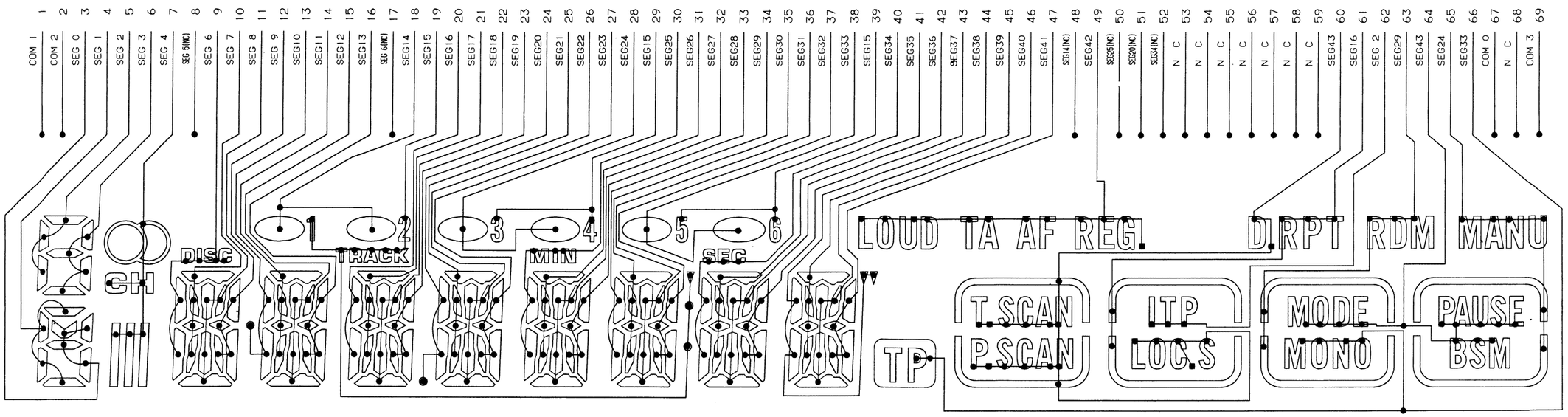
Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

Fig. 42

- **LCD (CAW1140, CAW1181)**

SEGMENT



COMMON

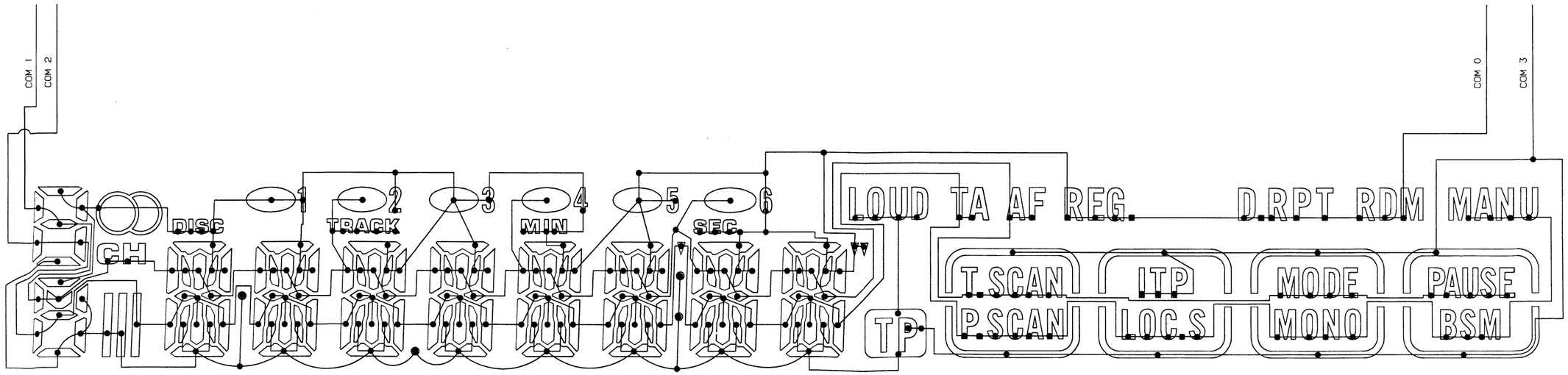
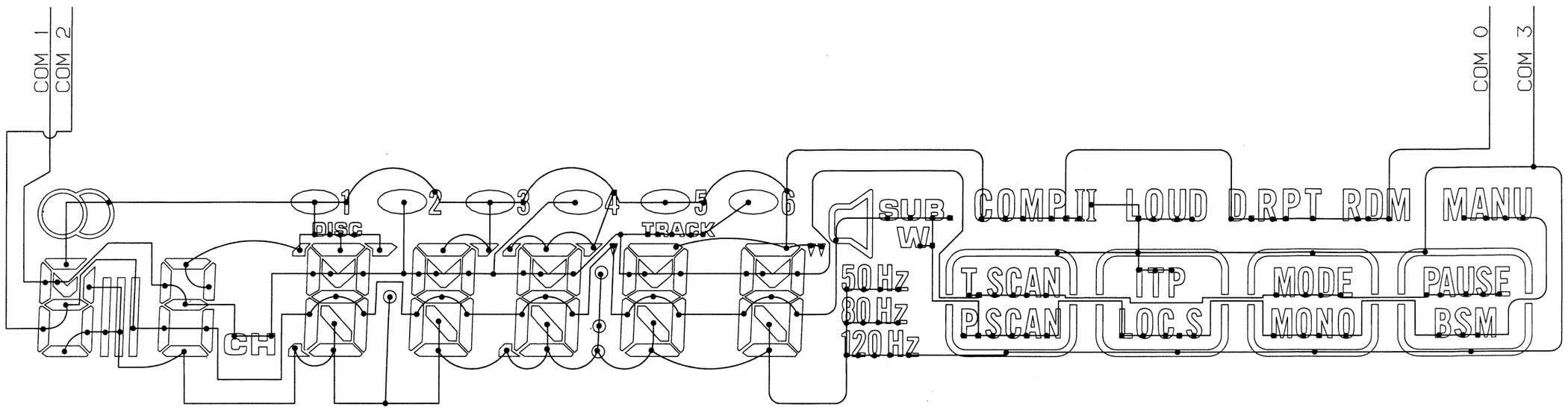


Fig. 43

• **LCD (CAW1141)**

COMMON



SEGMENT

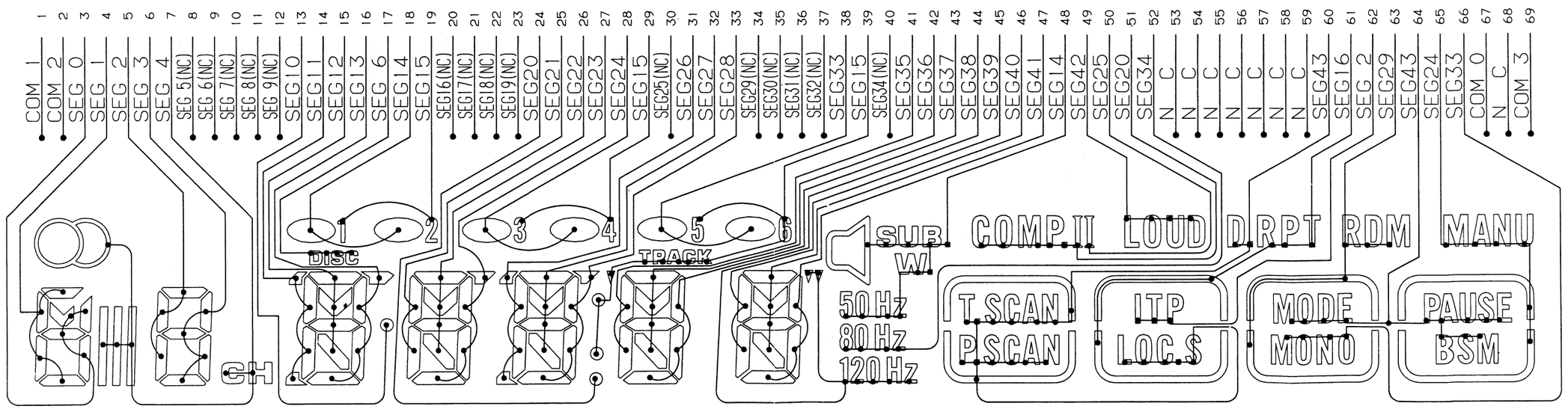


Fig. 44

11. CIRCUIT DIAGRAM AND P.C.BOARD PATTERN

- **Tuner Amp Unit (DEH-M980RDS/EW, X1B)**

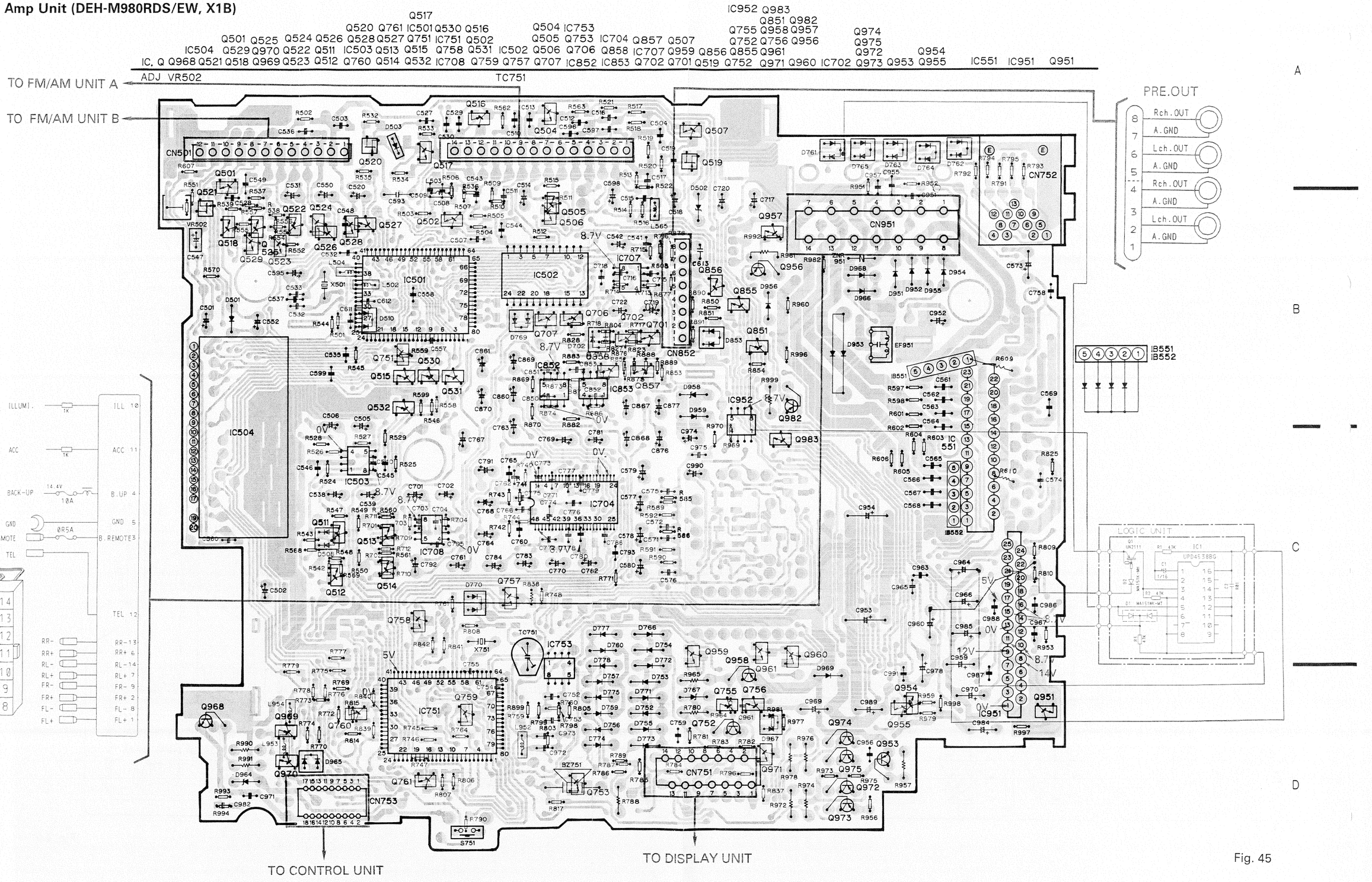
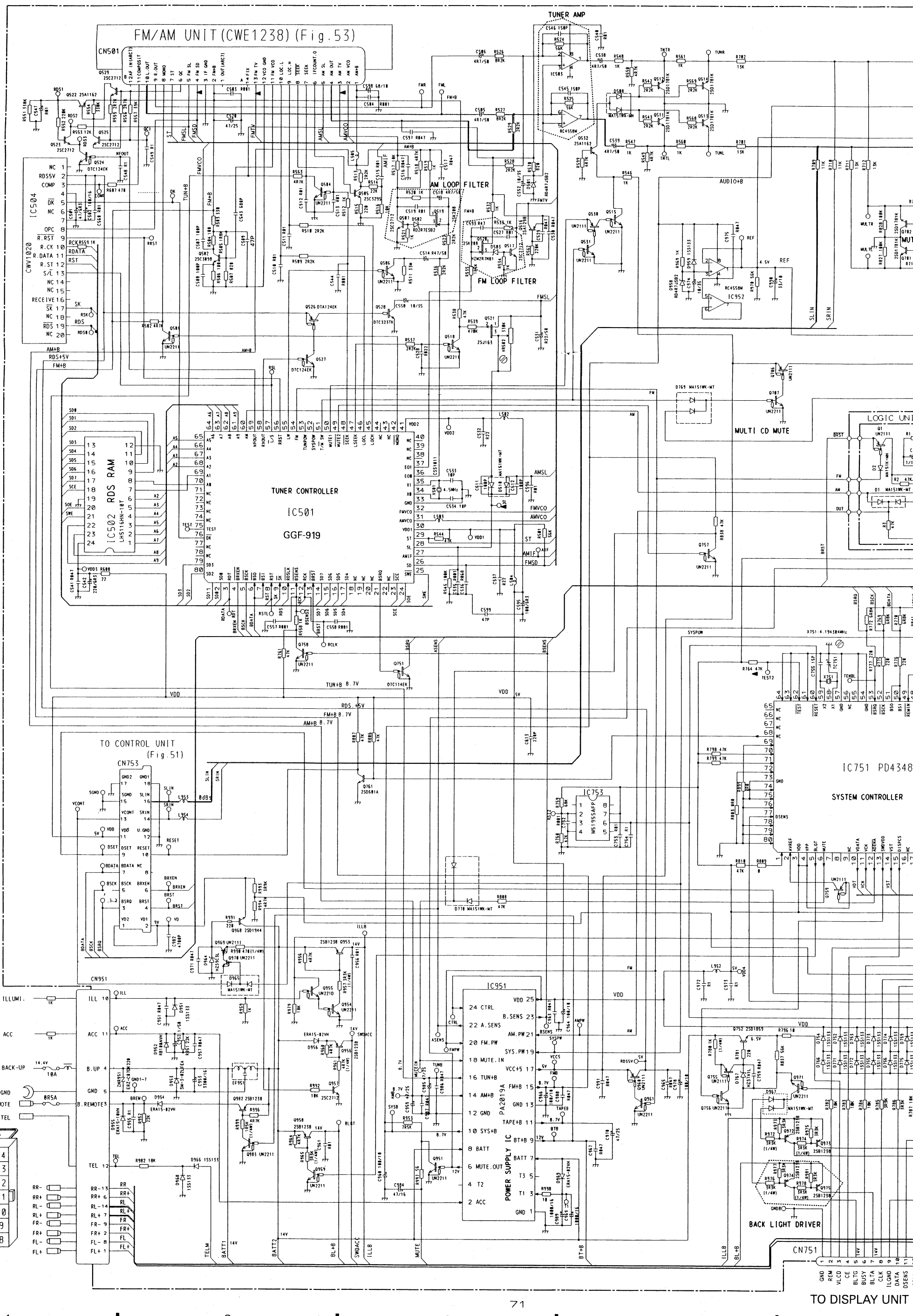


Fig. 45

• Tuner Amp Unit (DEH-M980RDS/EW, X1B)



NOTE:

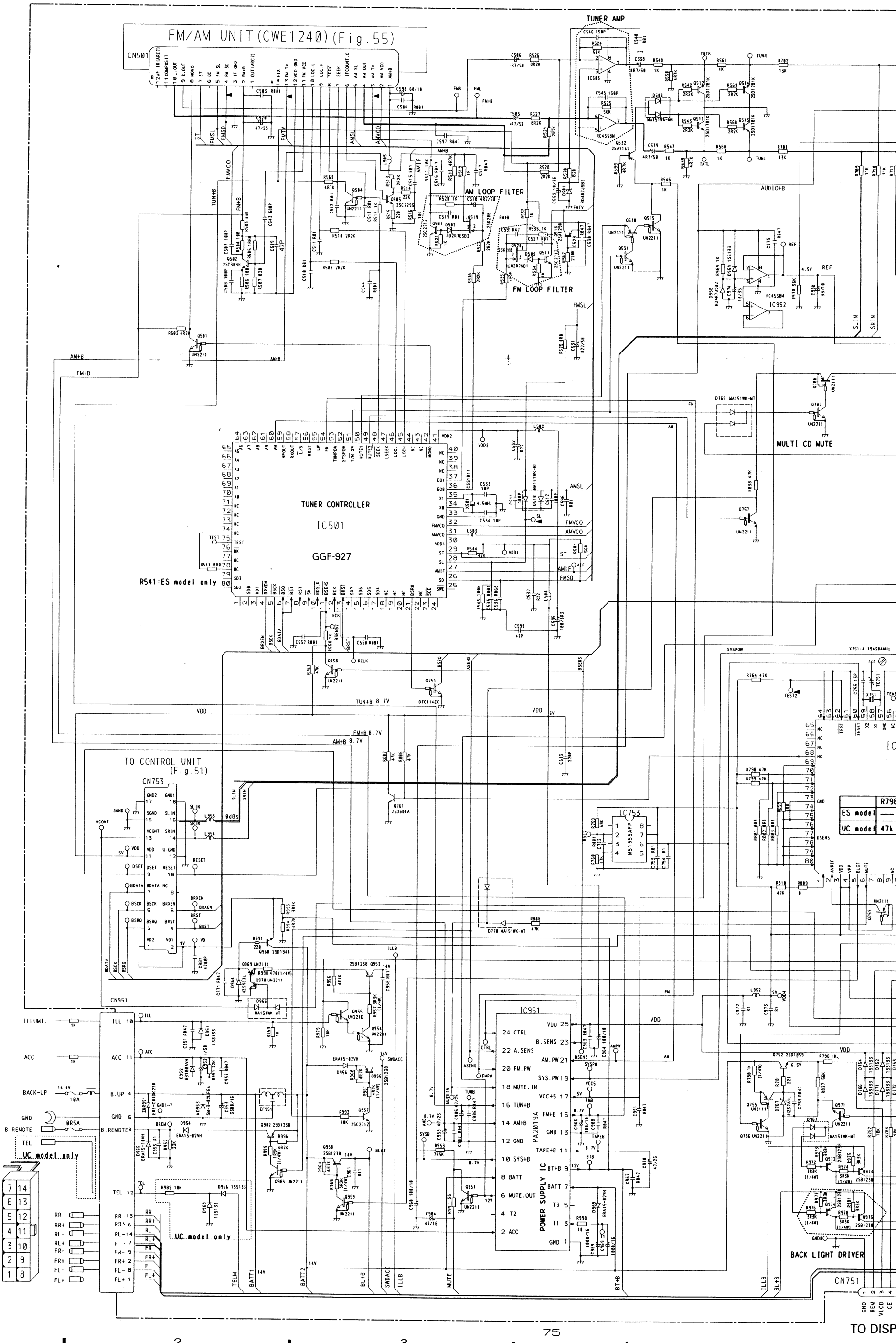
Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.

Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

MIXING AMP
MULTI CD AMP
MUTE
REAR PRE AMP
FRONT PRE AMP
E.VOLUME
LOGIC UNIT
SYSTEM CONTROLLER
POWER AMP
TO MULTI-CD PLAYER
Pre.OUT

• Tuner Amp Unit (DEH-M980/UC, M940/ES)



NOTE :

Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.

Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

MIXING AMP
MULTI CD AMP
MUTE
REAR PRE AMP
FRONT PRE AMP
IC704 E.VOLUME
PMJ881A
IC751 PD4348C
SYSTEM CONTROLLER
POWER AMP
4ch IC551 PA3027A
LIGHT DRIVER
Pre.OUT
TO MULTI-CD PLAYER
TO DISPLAY UNIT (Fig. 57)
UC model only

	R798	R799	R801	R802
ES model	—	47k	0	—
UC model	47k	—	—	0

Fig. 47

• Tuner Amp Unit (DEH-M980/UC, M940/ES)

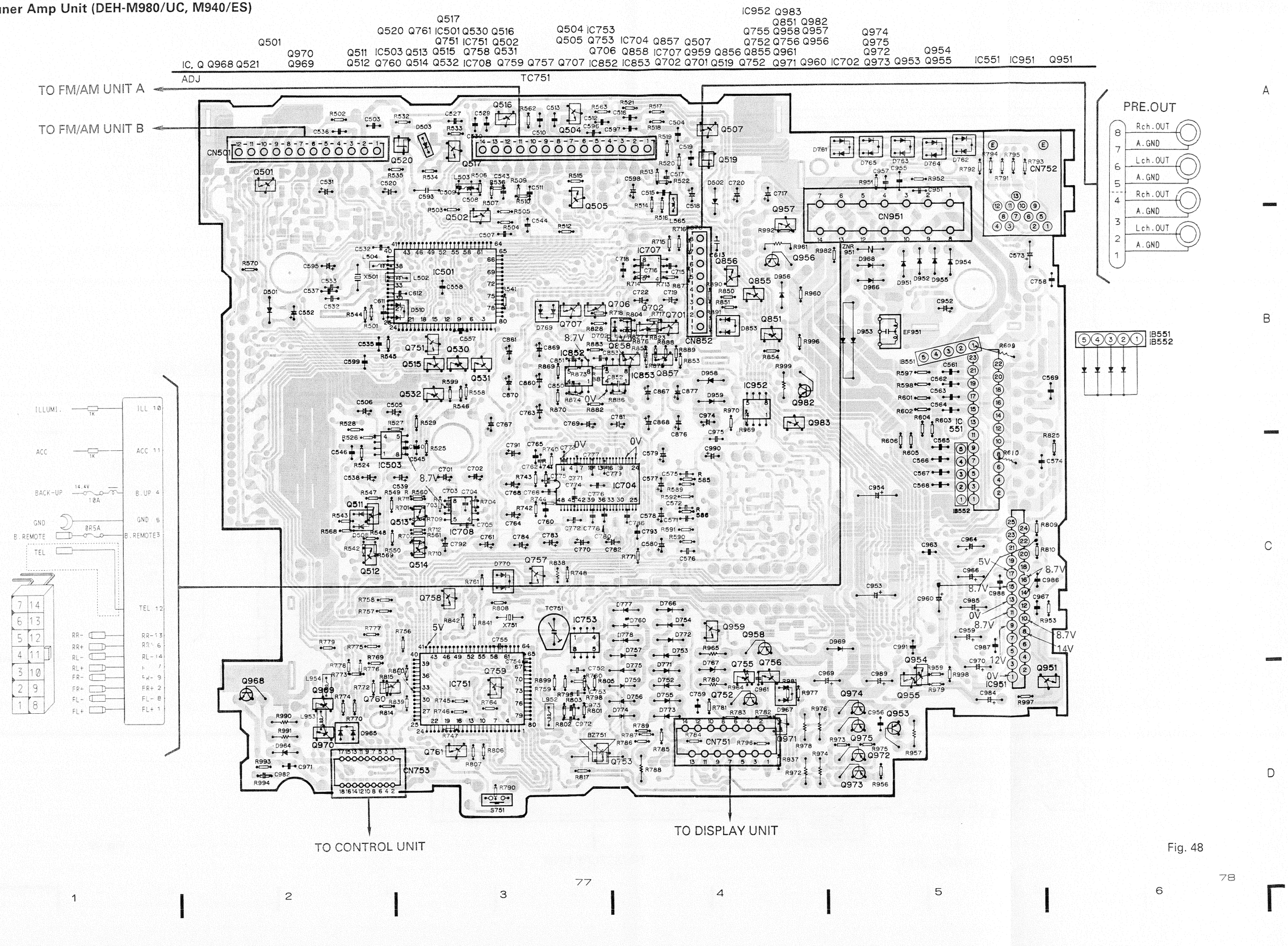


Fig. 48

• **Tuner Amp Unit (DEH-M77/US)**

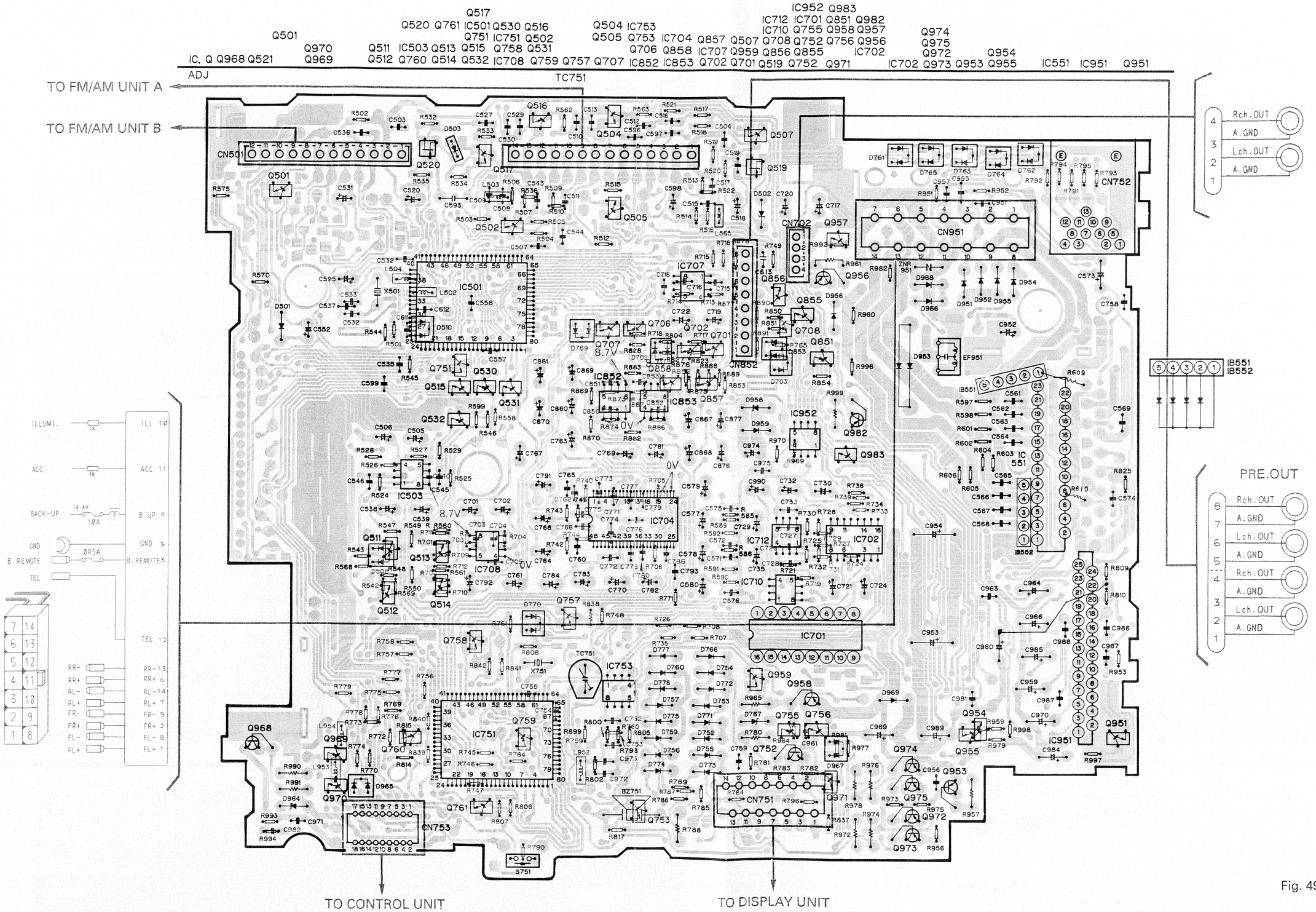
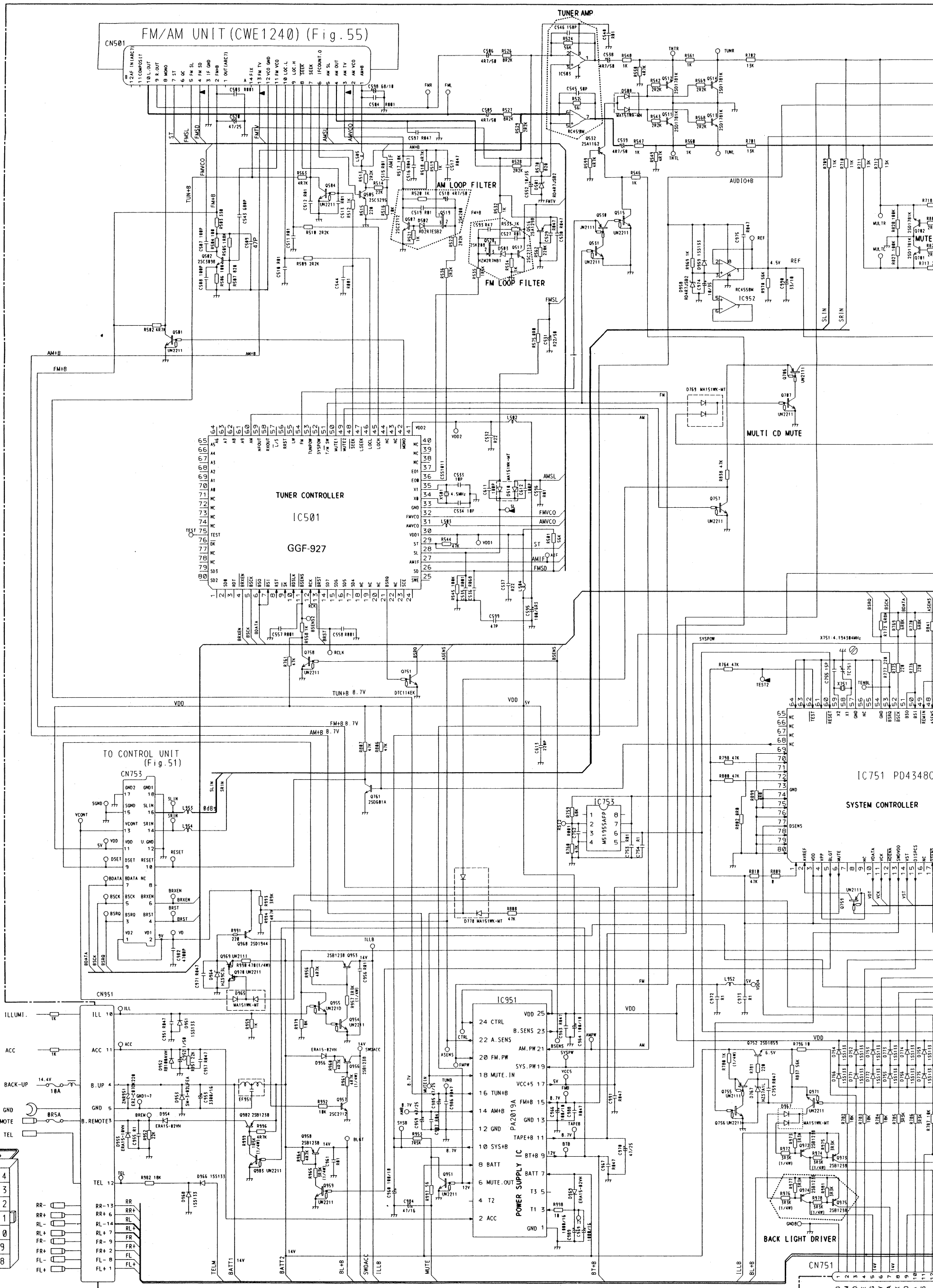


Fig. 49

• Tuner Amp Unit (DEH-M77/US)



NOTE:

Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.

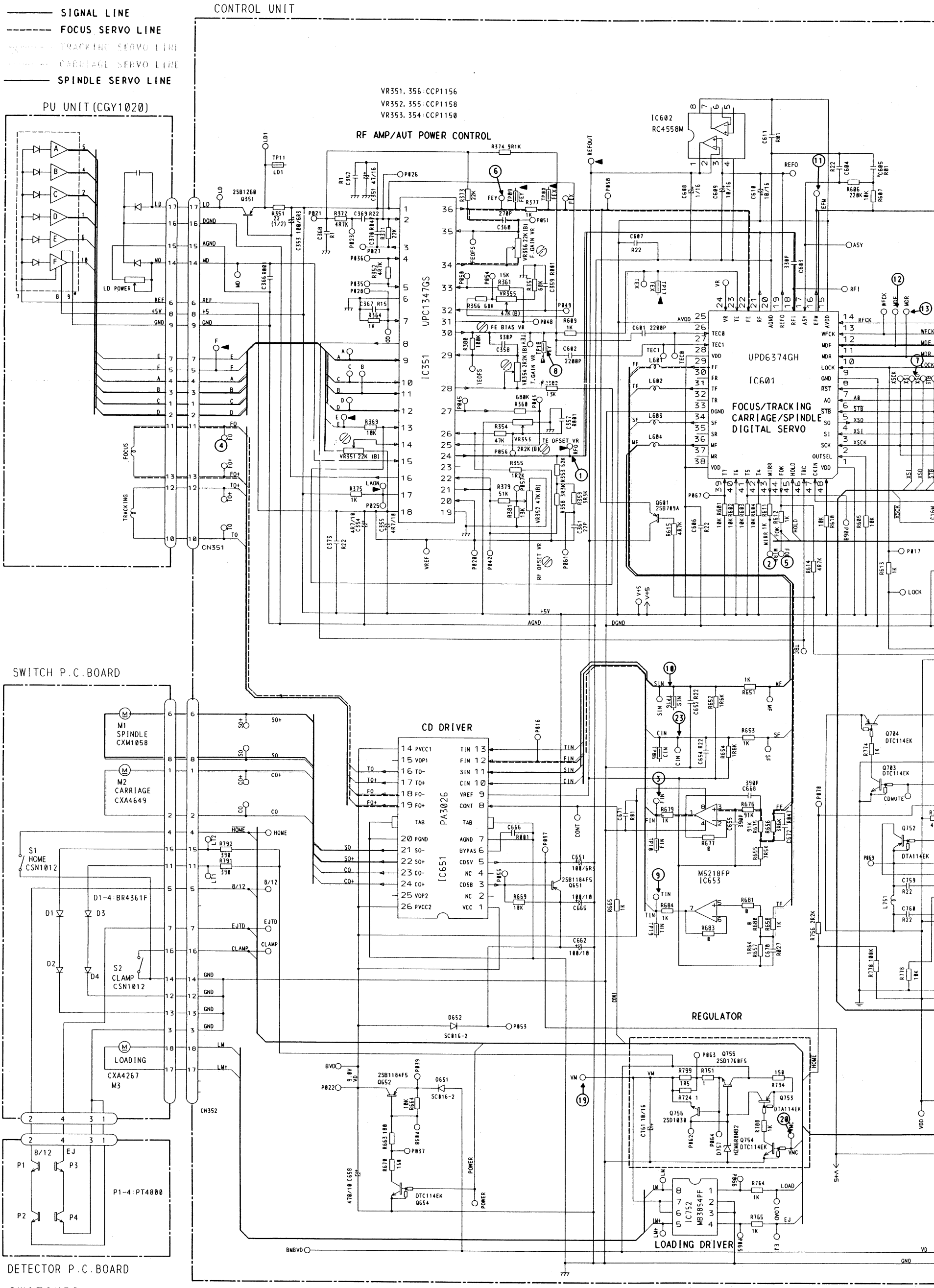
Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

MIXING AMP
MULTI CD AMP
MUTE
BUFFER AMP
H.P.F
L.P.F
REAR PRE AMP
FRONT PRE AMP
POWER AMP 4ch IC551 PA3027A
IC704 E.VOLUME
SUB W.E. VOLUME
IC751 PD4348C
STEM CONTROLLER
DISPLAY UNIT (Fig. 57)
TO MULTI-CD PLAYER

Fig. 50

• CD Mechanism Module



SWITCHES:

SWITCH P.C. BOARD

S1 : HOME SWITCH ..... ON–OFF

S2 : CLAMP SWITCH ..... ON–OFF

The underlined indicates the switch position.

NOTE:

⊏⊐ Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.

⊣⊢ Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

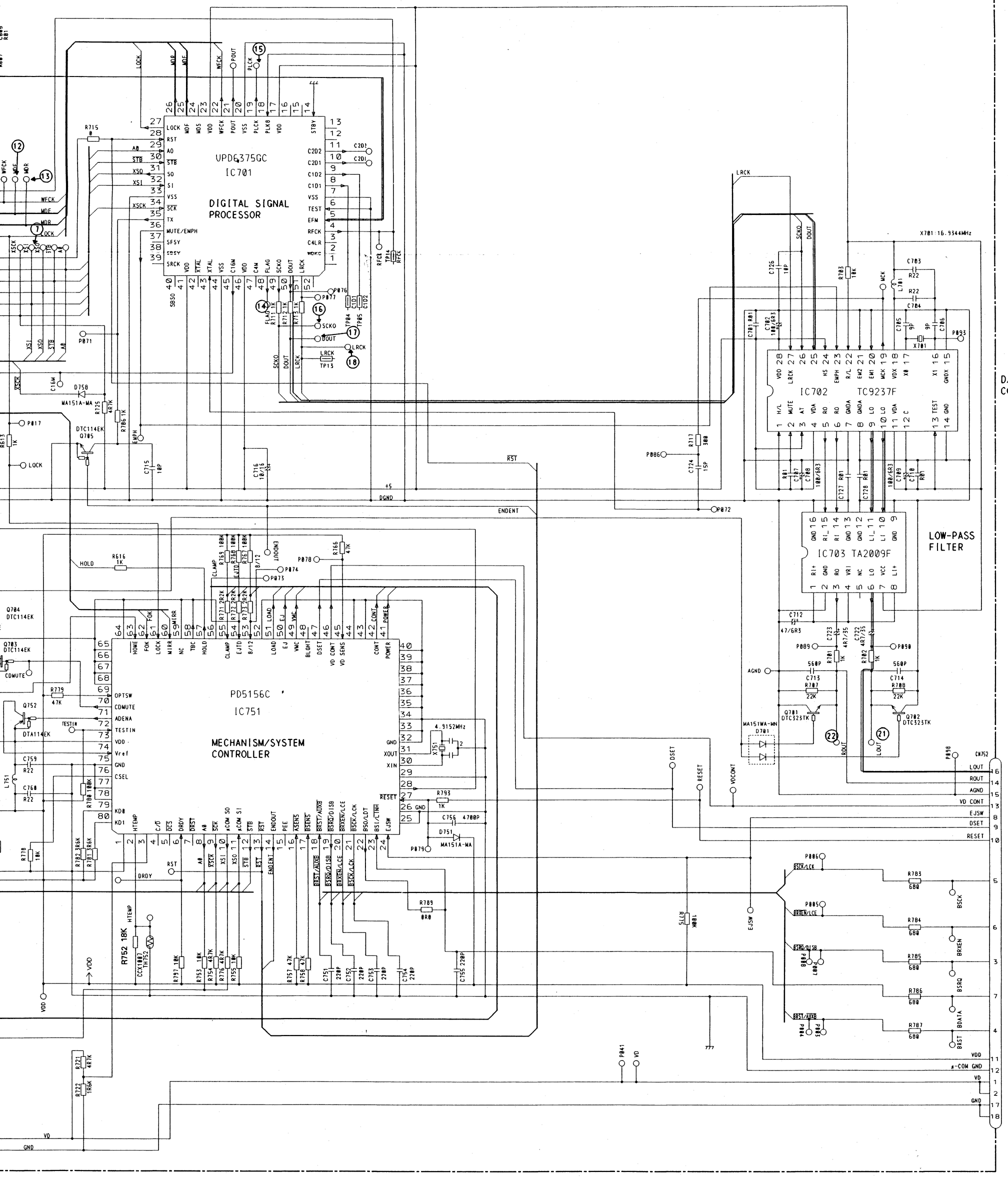
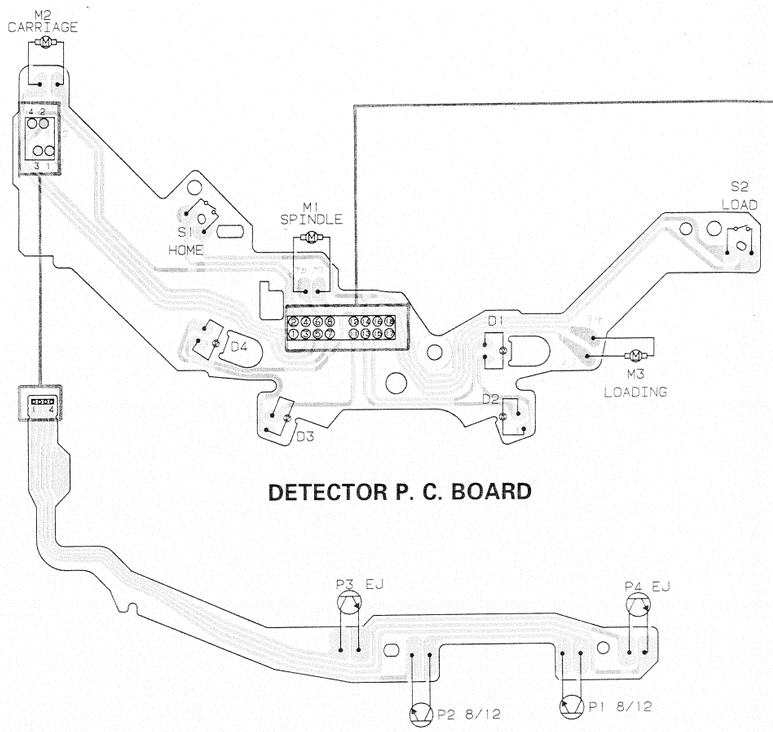


Fig. 5

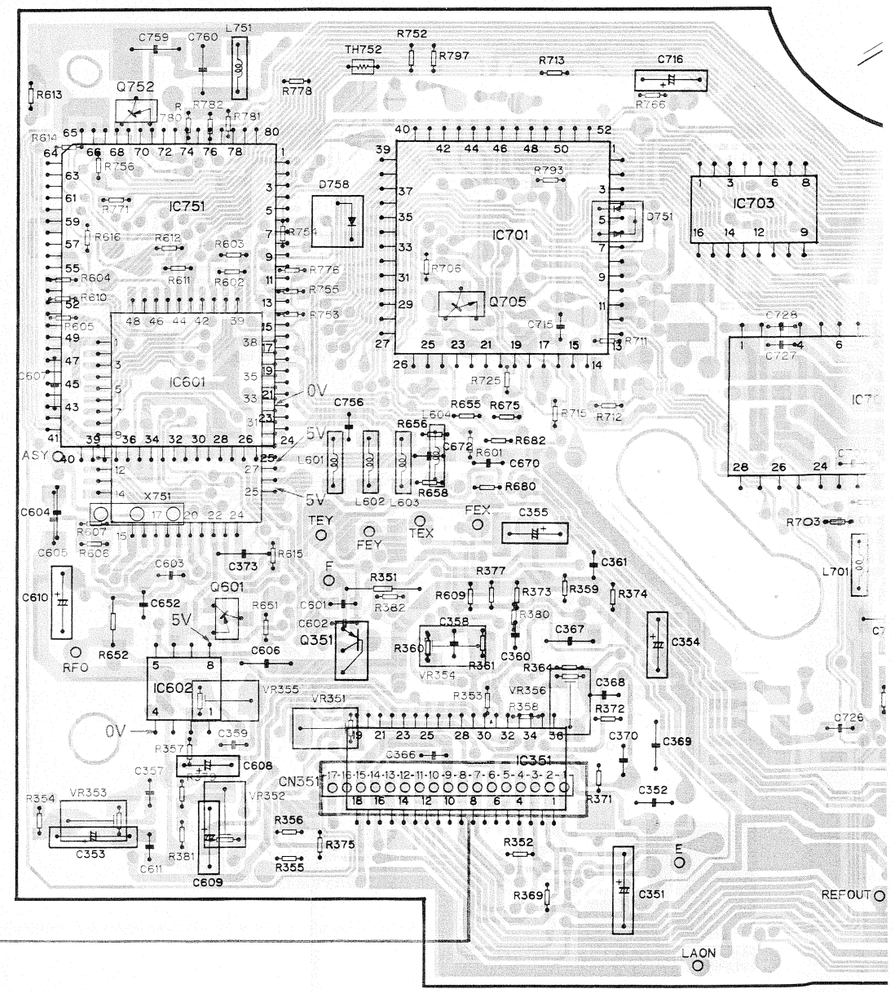
• **CD Mechanism Module**

SWITCH P. C. BOARD

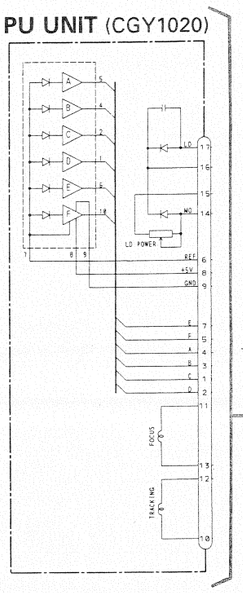


DETECTOR P. C. BOARD

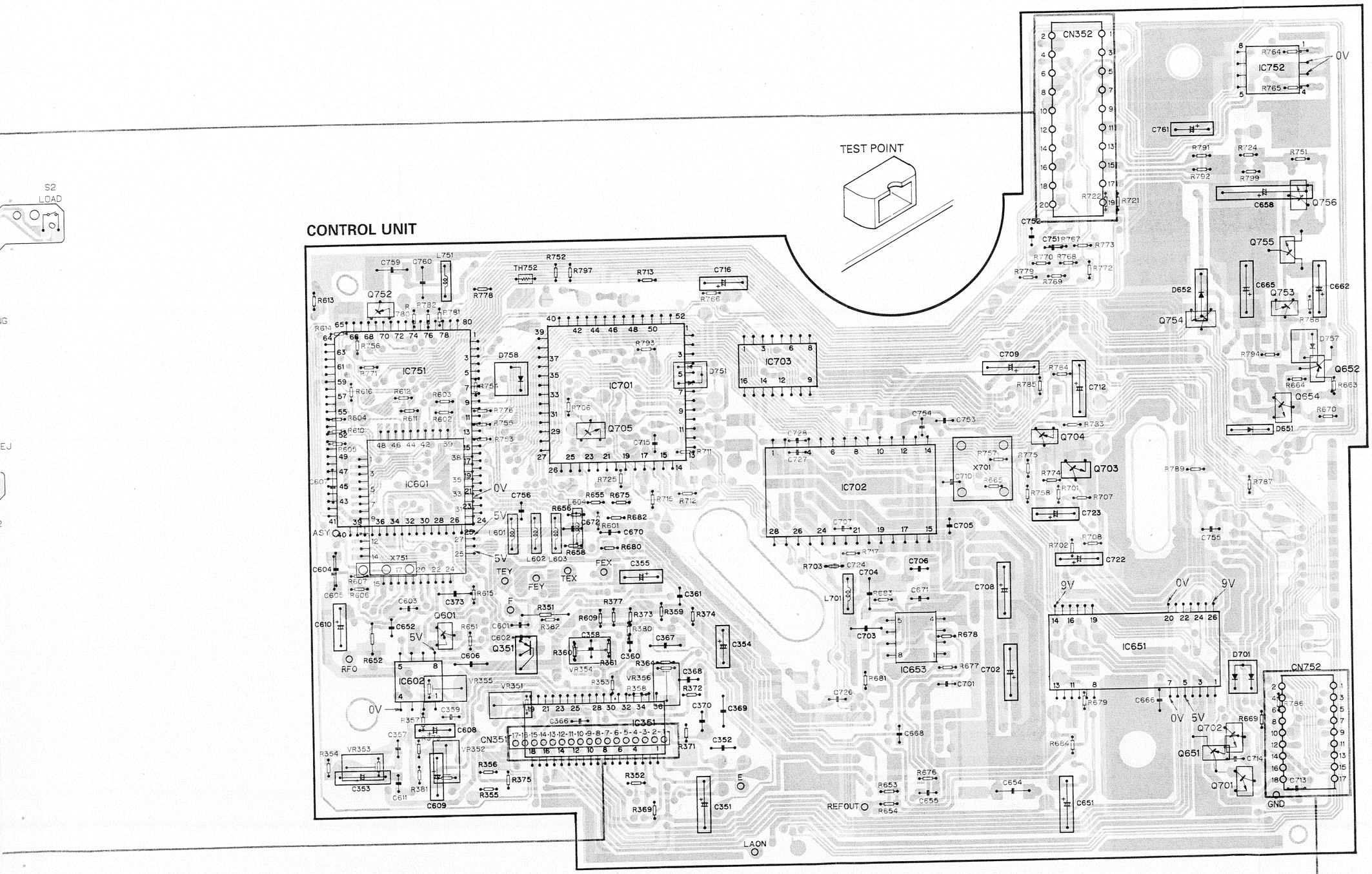
CONTROL UNIT



PU UNIT (CGY1020)



CONTROL UNIT



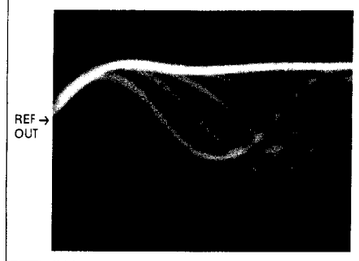
ADJ	IC, Q	
	IC752	A
	Q756	—
	Q755	
	Q752	
	Q753	
	Q754	
	IC703	B
	IC701	
	IC751	
	Q652	
	Q705	
	Q654	
	Q653	
	Q704	
	IC601	
	Q703	—
	IC702	
	IC653	C
	Q601	
	Q351	
VR354		
VR356	IC651	
VR355	IC602	
VR351		
	IC351	
	Q702	
VR352	Q651	
VR353		
	Q701	

Fig. 52

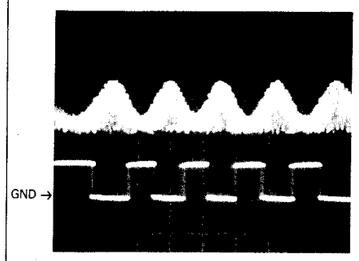
• Wave Forms

Note: 1. The encircled numbers denote measuring pointes in the circuit diagram.
2. Reference voltage
REFOUT: 2.5V

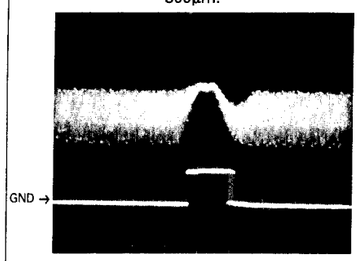
① RFO 0.5V/div. 0.2µs/div.
Normal mode: play



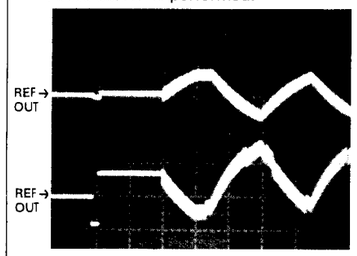
① CH1: RFO 1V/div.
② CH2: MIRR 5V/div. 0.5ms/div.
Test mode: Tracking open



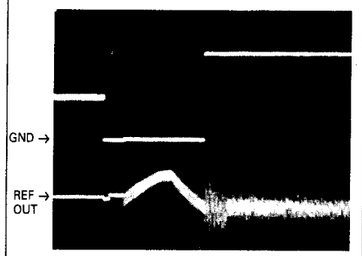
① CH1: RFO 1V/div.
② CH2: MIRR 5V/div. 0.5ms/div.
Normal mode: The defect part passes 800µm.



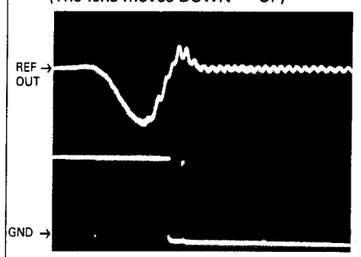
③ CH1: FIN 1V/div.
④ CH2: FO 2V/div. 0.5s/div.
Test mode: Connect the FEX to REFOUT.
Focus search is performed.



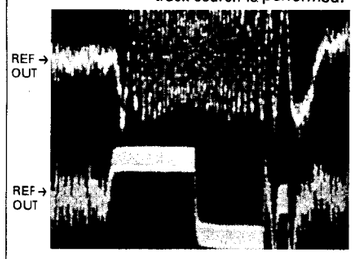
⑤ CH1: FOK 2V/div.
③ CH2: FIN 1V/div. 0.5s/div.
Normal mode: Focus close



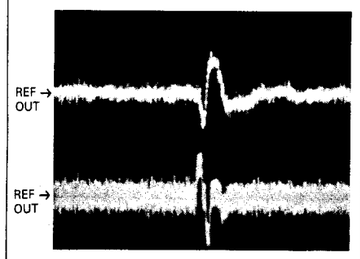
⑥ CH1: FEY 1V/div.
⑦ CH2: XSO 2V/div. 2ms/div.
Normal mode: Focus close
(The lens moves DOWN → UP)



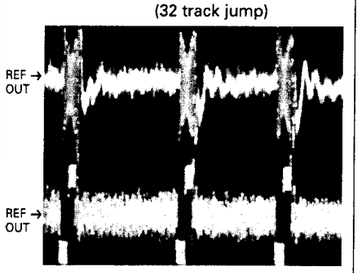
⑧ CH1: TEY 0.5V/div.
⑨ CH2: TIN 0.5V/div. 0.5ms/div.
Normal mode: Brake wave from when track search is performed.



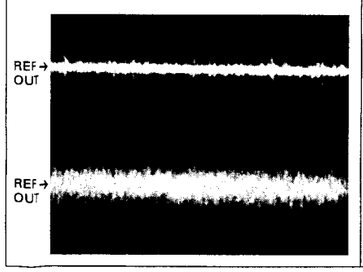
⑧ CH1: TEY 1V/div.
⑨ CH2: TIN 0.5V/div. 1ms/div.
Normal mode: single jump



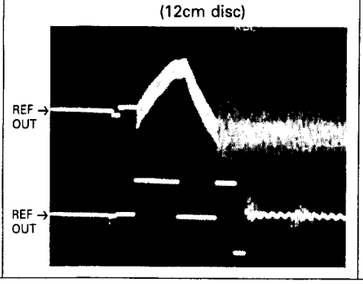
⑧ CH1: TEY 0.5V/div.
⑨ CH2: TIN 0.5V/div. 5ms/div.
Normal mode: Track search
(32 track jump)



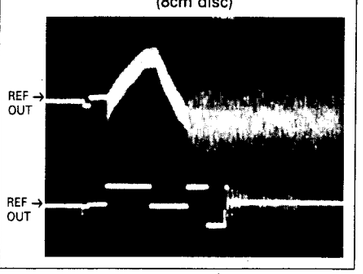
⑥ CH1: FEY 0.2V/div.
③ CH2: FIN 0.5V/div. 20ms/div.
Normal mode: Play



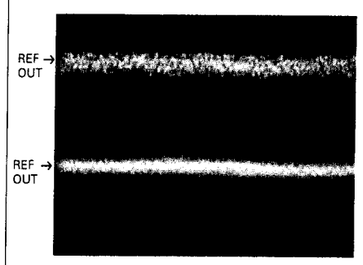
③ CH1: FIN 0.5V/div.
⑩ CH2: SIN 1V/div. 0.5s/div.
Normal mode: Focus search
(12cm disc)



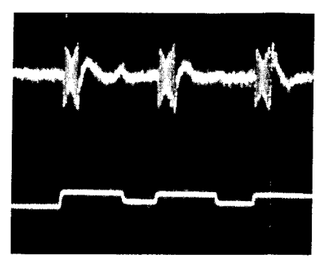
③ CH1: FIN 0.5V/div.
⑩ CH2: SIN 1V/div. 0.5s/div.
Normal mode: Focus search
(8cm disc)



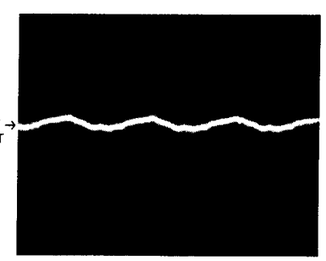
⑧ CH1: TEY 0.5V/div.
⑨ CH2: TIN 0.5V/div. 20ms/div.
Normal mode: Play



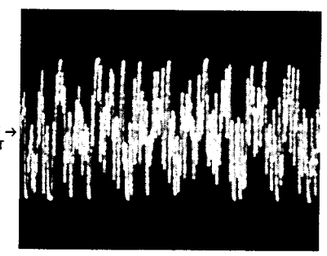
⑧ CH1: TEY
㉓ CH2: CIN 1V/div. 5ms/div.
Normal mode: Search



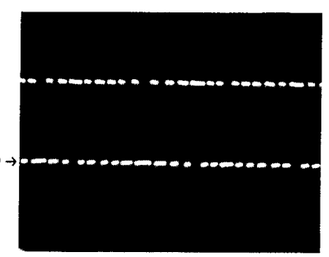
⑩ SIN 0.5V/div. 50ms/div.
Normal mode: Play (12cm disc)



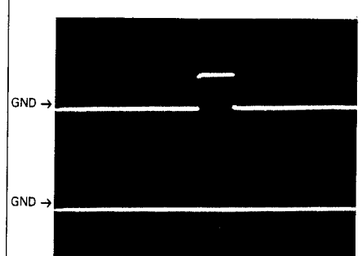
⑩ SIN 0.5V/div. 10ms/div.
Search (12cm disc)



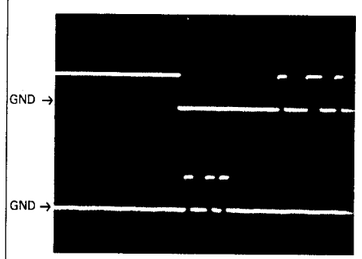
⑪ EFM 2V/div. 5µs/div.
Play



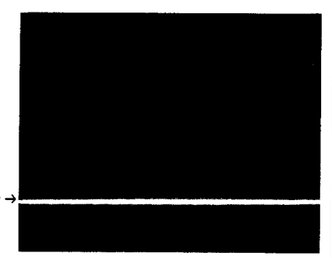
⑫ CH1: MDF 5V/div.
⑬ CH2: MDR 5V/div. 2ms/div.
Play



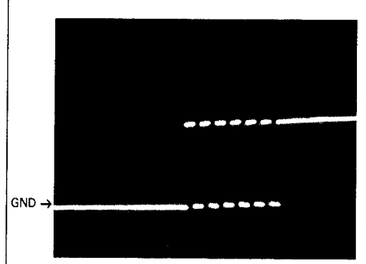
⑫ CH1: MDF 5V/div.
⑬ CH2: MDR 5V/div. 10ms/div.
Search



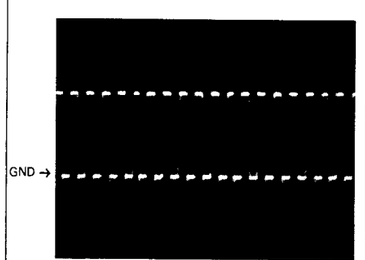
⑭ FLAG 2V/div. 0.1ms/div.
Play



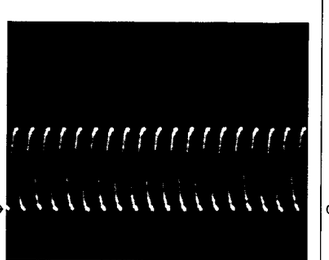
⑭ FLAG 2V/div. 0.1ms/div.
Search



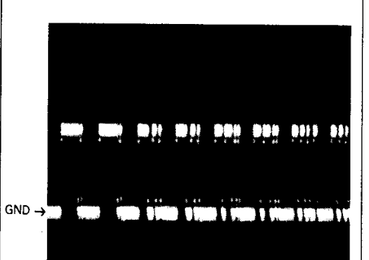
⑮ PLCK 2V/div. 0.5µs/div.
Play



⑯ SCKO 2V/div. 1µs/div.
Play

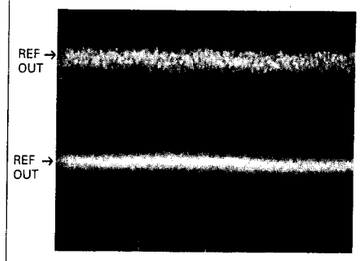


⑰ Dout 2v/div. 10µs/div.
Play



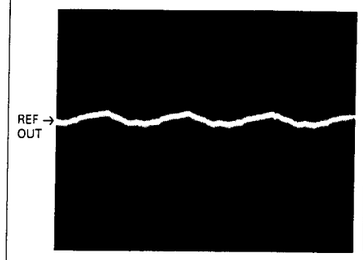
⑱ LRC
Play

⑧ CH1: TEY 0.5V/div.
⑨ CH2: TIN 0.5V/div. 20ms/div.
Normal mode: Play

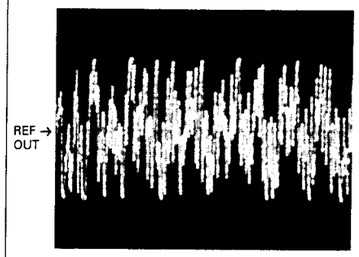


⑧ CH1: TEY 1V/div. 5ms/div.
㉓ CH2: CIN
Normal mode: Search

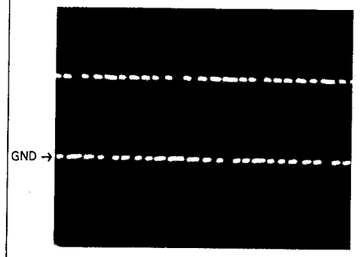
⑩ SIN 0.5V/div. 50ms/div.
Normal mode: Play (12cm disc)



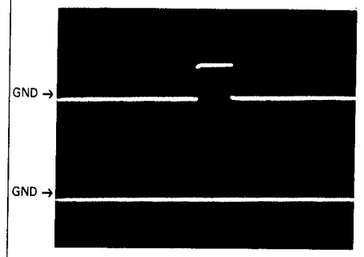
⑩ SIN 0.5V/div. 10ms/div.
Search (12cm disc)



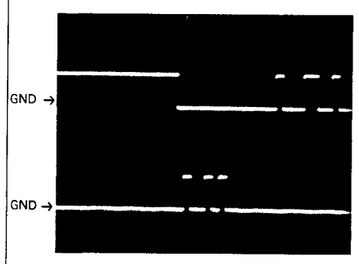
⑪ EFM 2V/div. 5µs/div.
Play



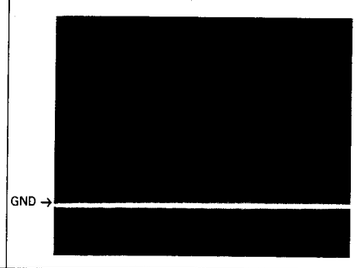
⑫ CH1: MDF 5V/div.
⑬ CH2: MDR 5V/div. 2ms/div.
Play



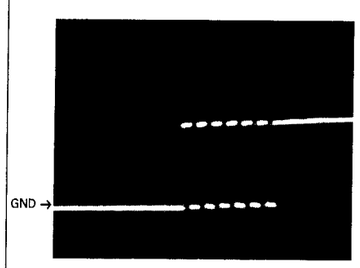
⑫ CH1: MDF 5V/div.
⑬ CH2: MDR 5V/div. 10ms/div.
Search



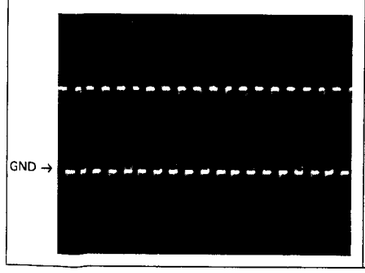
⑭ FLAG 2V/div. 0.1ms/div.
Play



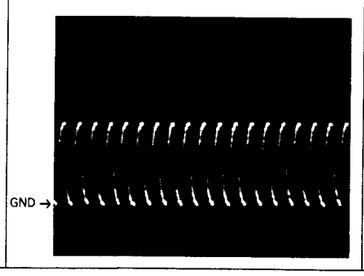
⑭ FLAG 2V/div. 0.1ms/div.
Search



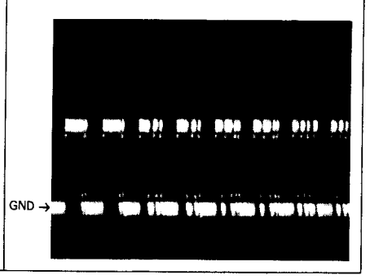
⑮ PLCK 2V/div. 0.5µs/div.
Play



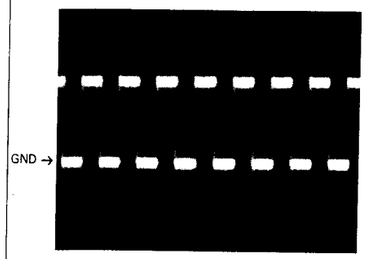
⑯ SCKO 2V/div. 1µs/div.
Play



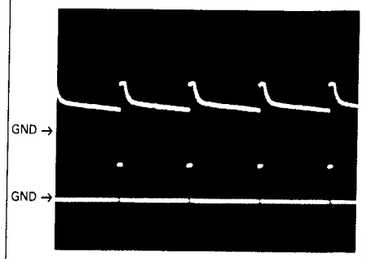
⑰ Dout 2v/div. 10µs/div.
Play



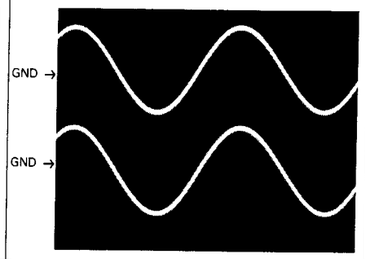
⑱ LRCK 2V/div. 20µs/div.
Play



⑲ CH1: VM 5V/div.
⑳ CH2: VMC 5V/div. 50ms/div.
Normal mode: No disc



㉑ CH1: Lout 1V/div.
㉒ CH2: Rout 1V/div. 0.2ms/div.
Play (1kHz)



• FM/AM Unit (DEH-M980RDS/EW,X1B)

FM/AM Unit (CWE1238)(DEH-M980RDS/EW,X1B)

FM/AM UNIT IC201

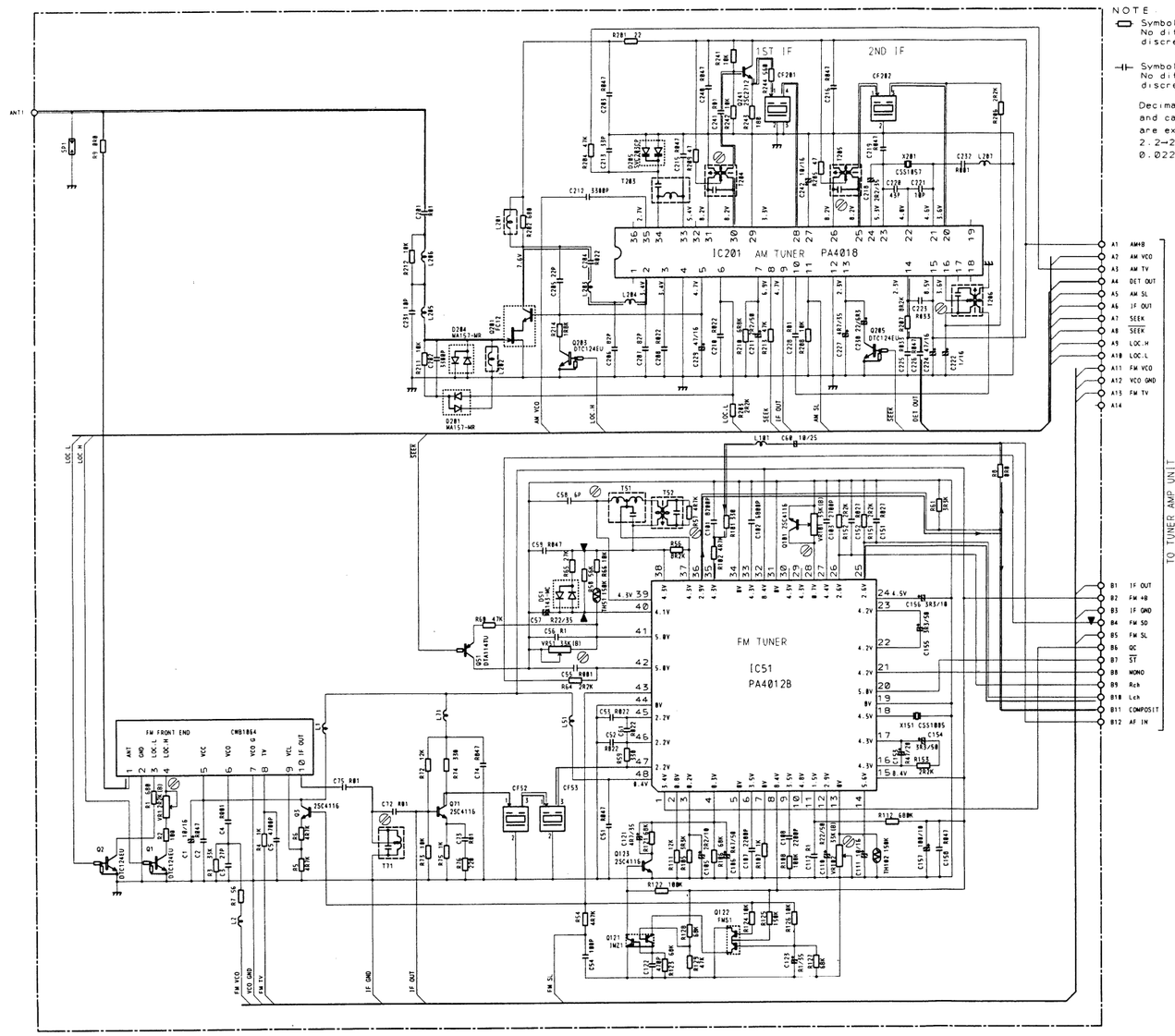
1	2	3	4	5	6	7	8
3.4V	3.4V	0V	4.7V			6.9V	4.7V
10	11	12	13	14	15	16	17
	0V	2.3V	2.3V	8.5V	3.6V		
19	20	21	22	23	24	25	26
	3.6V	4.6V	4.0V	5.3V	8.2V		
28	29	30	31	32	33	34	35
3.3V	0V	8.2V	8.2V	5.4V			2.1V

NOTE

Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.

Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as
2.2→2R2
0.022→R022



IC, Q Q205 IC201 Q241 Q201 Q203 Q1
ADJ T206 T205 T204 T203

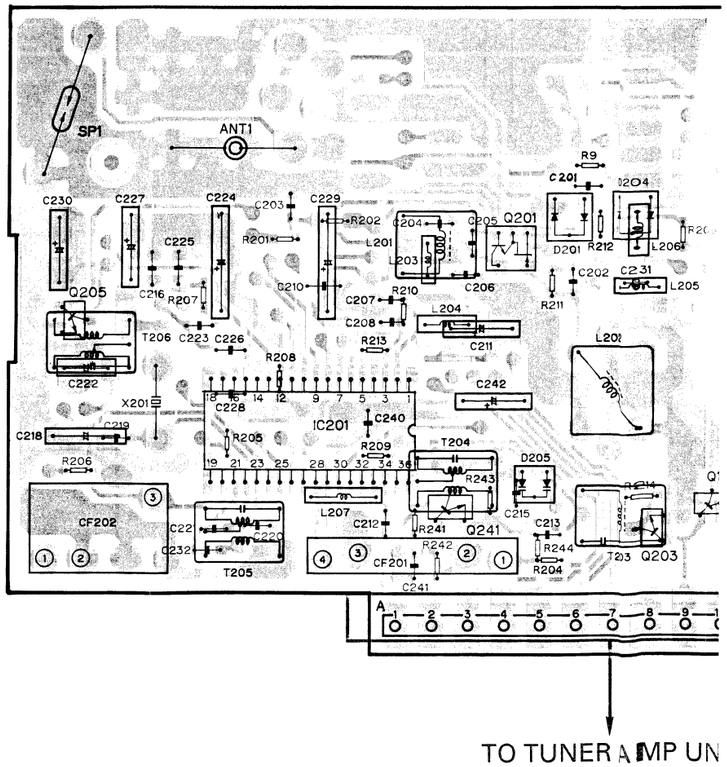


Fig. 53

NOTE:
- Symbol indicates a resistor. No differentiation is made between chip resistors and discrete resistors.
- Symbol indicates a capacitor. No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

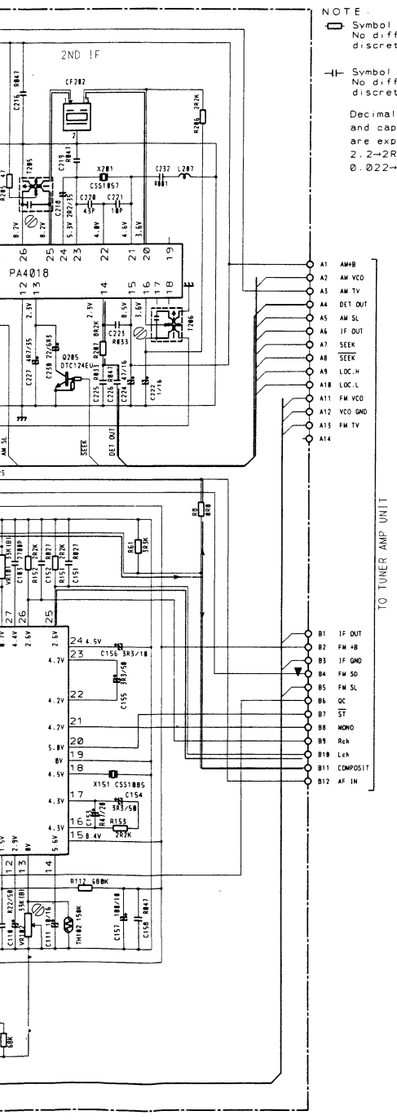


Fig. 53

FM/AM UNIT IC201

1	2	3	4	5	6	7	8	9
3.4V	3.4V	0V	4.7V			6.9V	4.7V	
10	11	12	13	14	15	16	17	18
	0V	2.3V	2.3V	8.5V	3.6V			
19	20	21	22	23	24	25	26	27
	3.6V	4.6V	4.0V	5.3V	8.2V			
28	29	30	31	32	33	34	35	36
3.3V	0V	8.2V	8.2V	5.4V			2.1V	

FM/AM UNIT IC51

1	2	3	4	5	6	7	8
3.4V	0.8V	0.2V	0.3V	0V	3.5V	0V	8.4V
9	10	11	12	13	14	15	16
3.5V	4.8V	1.5V	2.9V	0V	5.6V	8.4V	4.3V
17	18	19	20	21	22	23	24
4.3V	4.5V	0V	5.0V	4.2V	4.2V	4.2V	4.5V
25	26	27	28	29	30	31	32
2.6V	2.6V	4.4V	0.7V	4.3V	4.3V	0V	8.4V
33	34	35	36	37	38	39	40
4.3V	0V	4.3V	2.9V	4.3V	4.3V	4.3V	4.1V
41	42	43	44	45	46	47	48
5.0V	5.0V	0V	2.2V	2.2V	2.2V	0.4V	

IC, Q Q205 IC201 Q241 Q201 Q203 Q1 Q2 Q122 Q121 Q123 Q3 Q51 Q71 IC51 Q101
ADJ T206 T205 T204 T203 VR1 T71 T51 VR51 T52 VR101 VR102

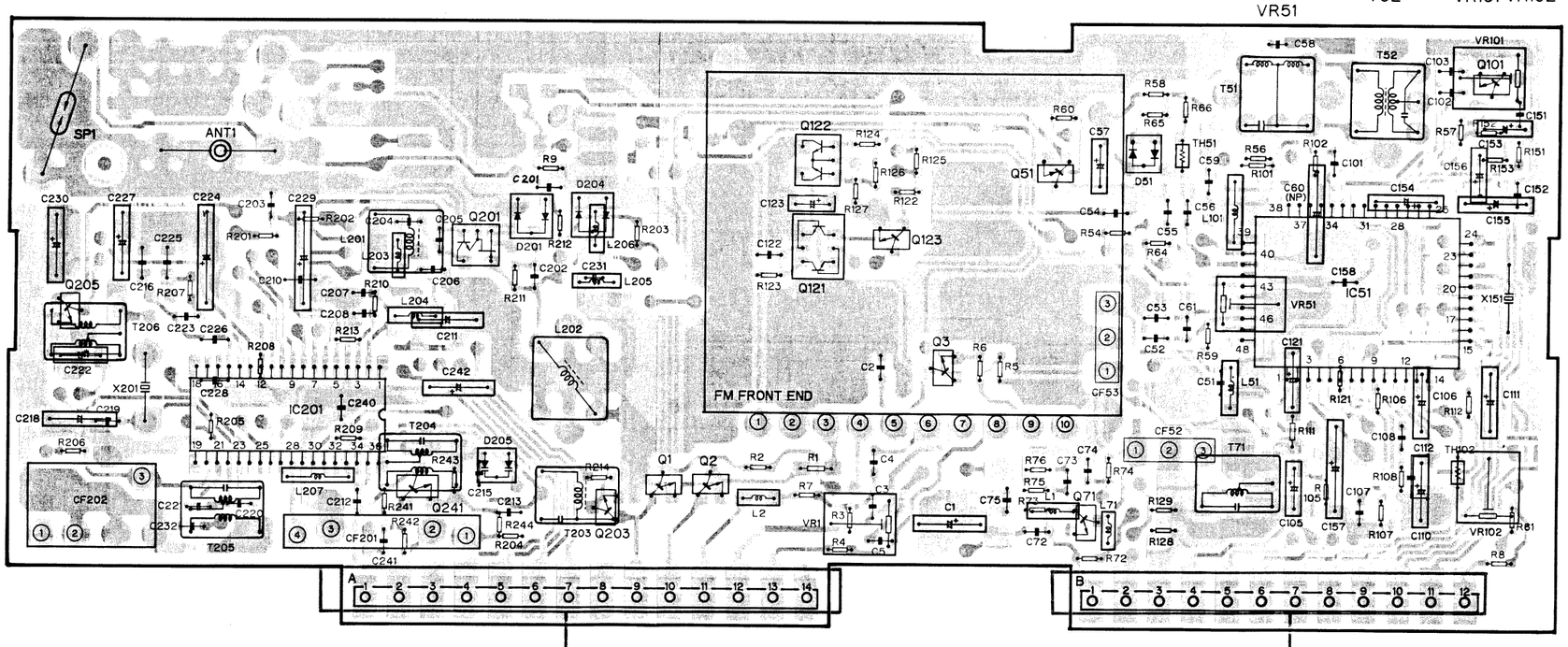


Fig. 54

• FM/AM Unit (DEH-M980/UC,M940/ES,M77/US)

FM/AM Unit (CWE1240)

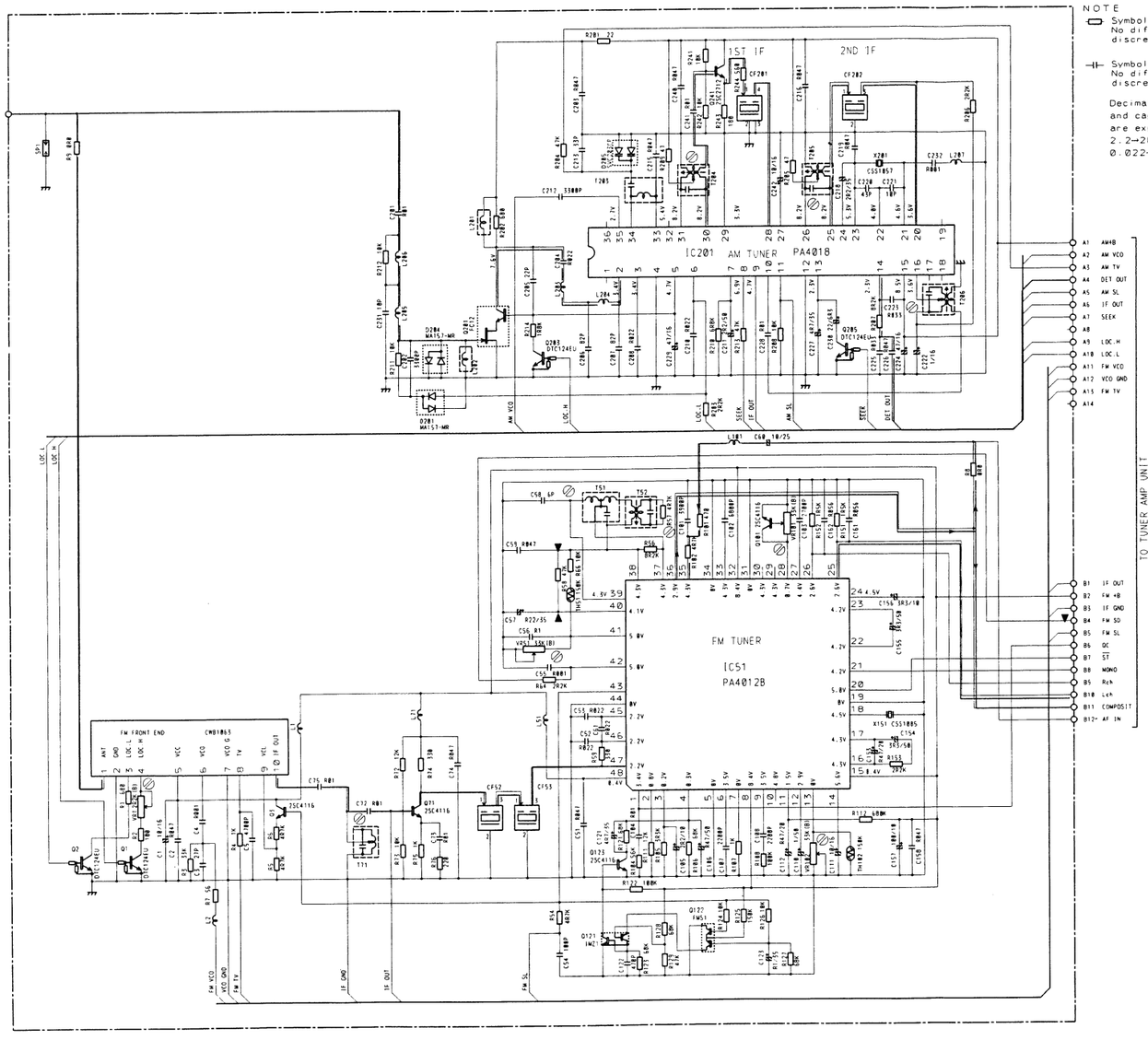
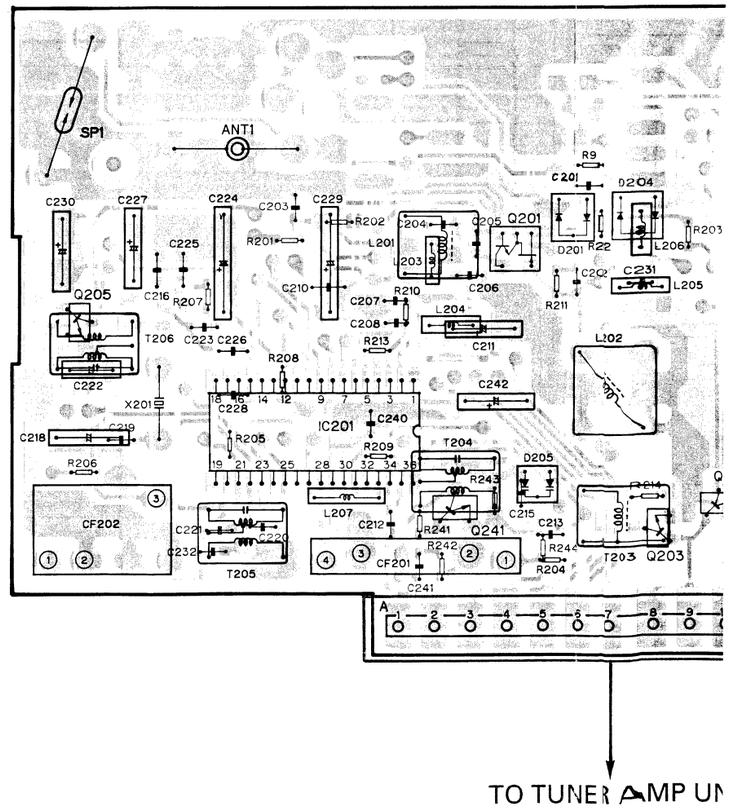


Fig. 55

FM/AM UNIT IC201

1	2	3	4	5	6	7	8	9
3.4V	3.4V	0V	4.7V			6.9V	4.7V	
10	11	12	13	14	15	16	17	18
	0V	2.3V	2.3V	8.5V	3.6V			
19	20	21	22	23	24	25	26	27
	3.6V	4.6V	4.0V	5.3V	8.2V			
28	29	30	31	32	33	34	35	36
3.3V	0V	8.2V	8.2V	5.4V			2.1V	

IC, Q Q205 IC201 Q241 Q201 Q203 Q1
ADJ T206 T205 T204 T203



NOTE

Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.

Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as
2.2→2R2
0.022→R022

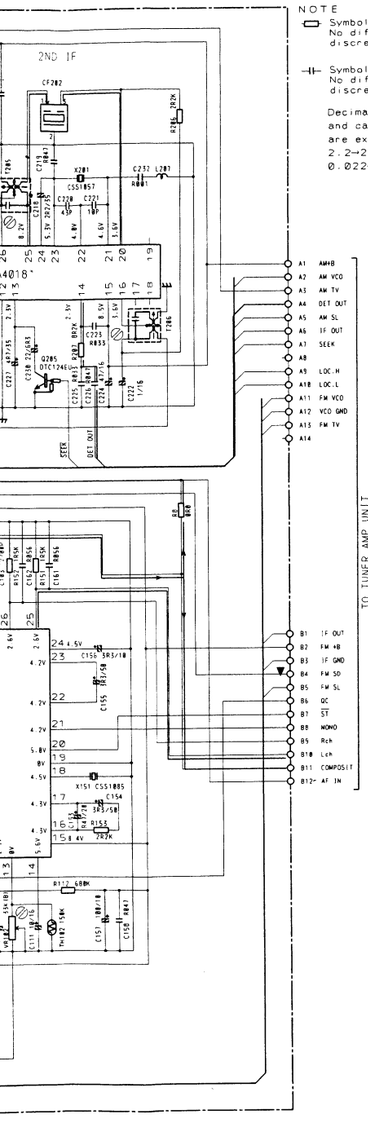


Fig. 55

FM/AM UNIT IC201

1	2	3	4	5	6	7	8	9
3.4V	3.4V	0V	4.7V			6.9V	4.7V	
10	11	12	13	14	15	16	17	18
	0V	2.3V	2.3V	8.5V	3.6V			
19	20	21	22	23	24	25	26	27
	3.6V	4.6V	4.0V	5.3V	8.2V			
28	29	30	31	32	33	34	35	36
3.3V	0V	8.2V	8.2V	5.4V			2.1V	

FM/AM UNIT IC51

1	2	3	4	5	6	7	8
3.4V	0.8V	0.2V	0.3V	0V	3.5V	0V	8.4V
9	10	11	12	13	14	15	16
3.5V	4.8V	1.5V	2.9V	0V	5.6V	8.4V	4.3V
17	18	19	20	21	22	23	24
4.3V	4.5V	0V	5.0V	4.2V	4.2V	4.2V	4.5V
25	26	27	28	29	30	31	32
2.6V	2.6V	4.4V	0.7V	4.3V	4.3V	0V	8.4V
33	34	35	36	37	38	39	40
4.3V	0V	4.3V	2.9V	4.3V	4.3V	4.3V	4.1V
41	42	43	44	45	46	47	48
5.0V	5.0V	0V	2.2V	2.2V	2.2V	0.4V	

IC. Q Q205 IC201 Q241 Q201 Q203 Q1 Q2 Q122 Q121 Q123 Q3 Q71 IC51 Q101

ADJ T206 T205 T204 T203 VR1 T71 T51 VR51 T52 VR101 VR102

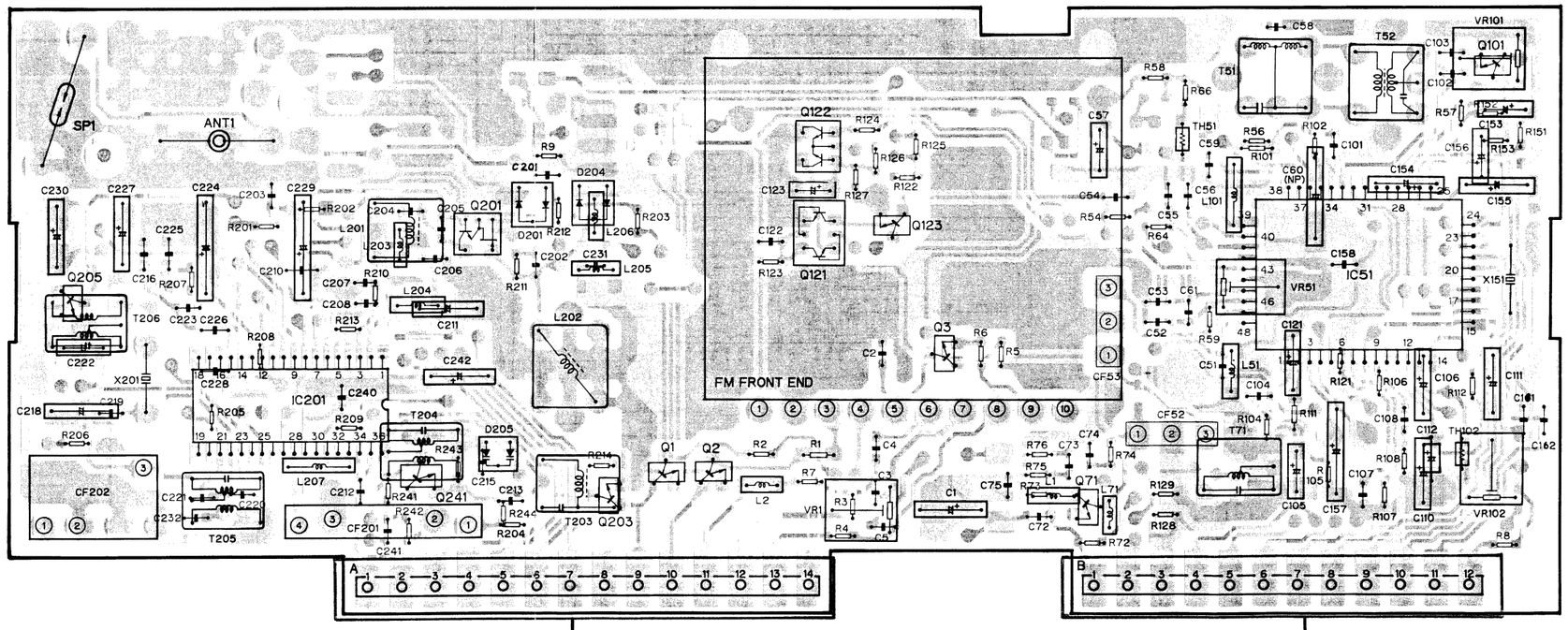
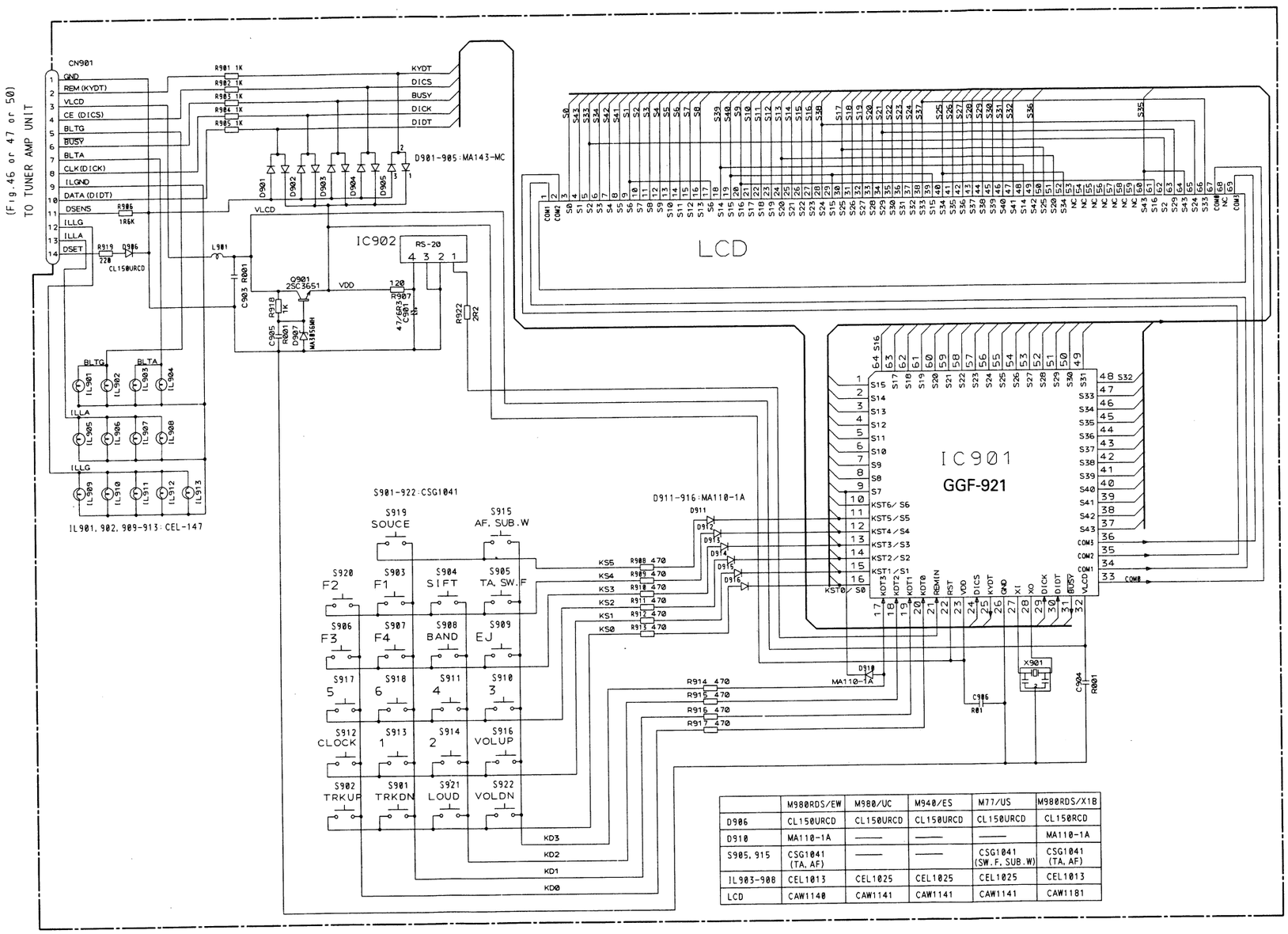


Fig. 56

• Display Unit

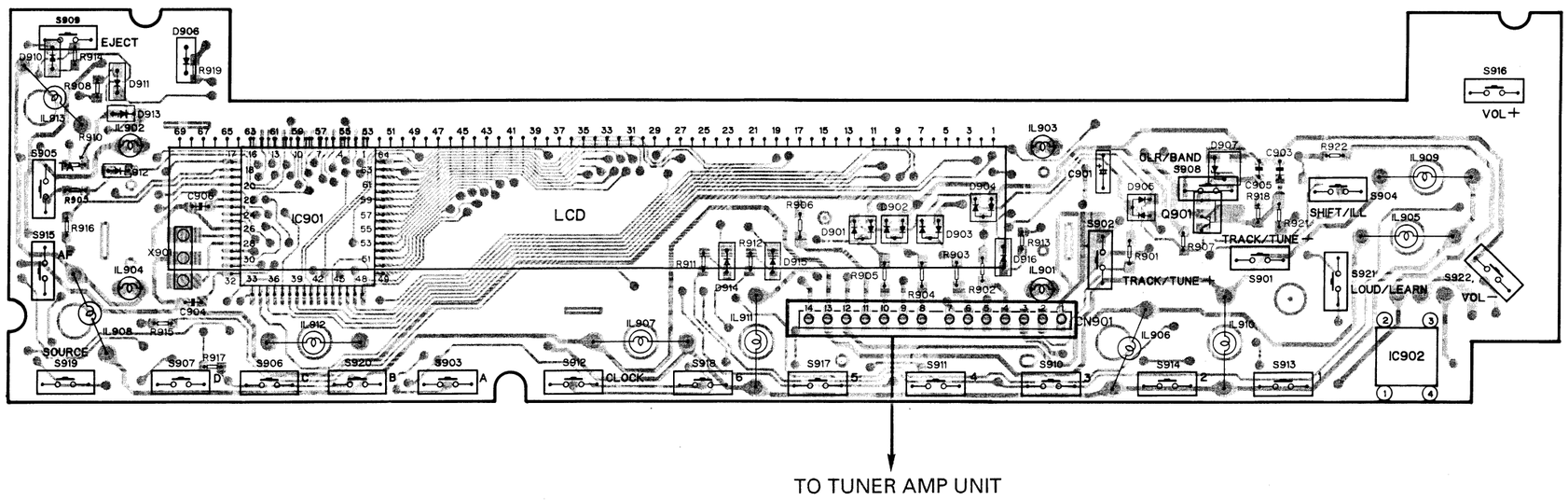


	M980RDS/EW	M980/UC	M940/ES	M77/US	M980RDS/X1B
D906	CL150URCD	CL150URCD	CL150URCD	CL150URCD	CL150RCD
D910	MA110-1A	——	——	——	MA110-1A
S905, 915	CSG1041 (TA, AF)	——	——	CSG1041 (SW.F, SUB.W)	CSG1041 (TA, AF)
IL903-908	CEL1013	CEL1025	CEL1025	CEL1025	CEL1013
LCD	CAW1140	CAW1141	CAW1141	CAW1141	CAW1181

Fig. 57

Fig. 57

IC, Q IC901 Q901 IC902



TO TUNER AMP UNIT

Fig. 58

12. CD MECHANISM MODULE EXPLODED VIEW

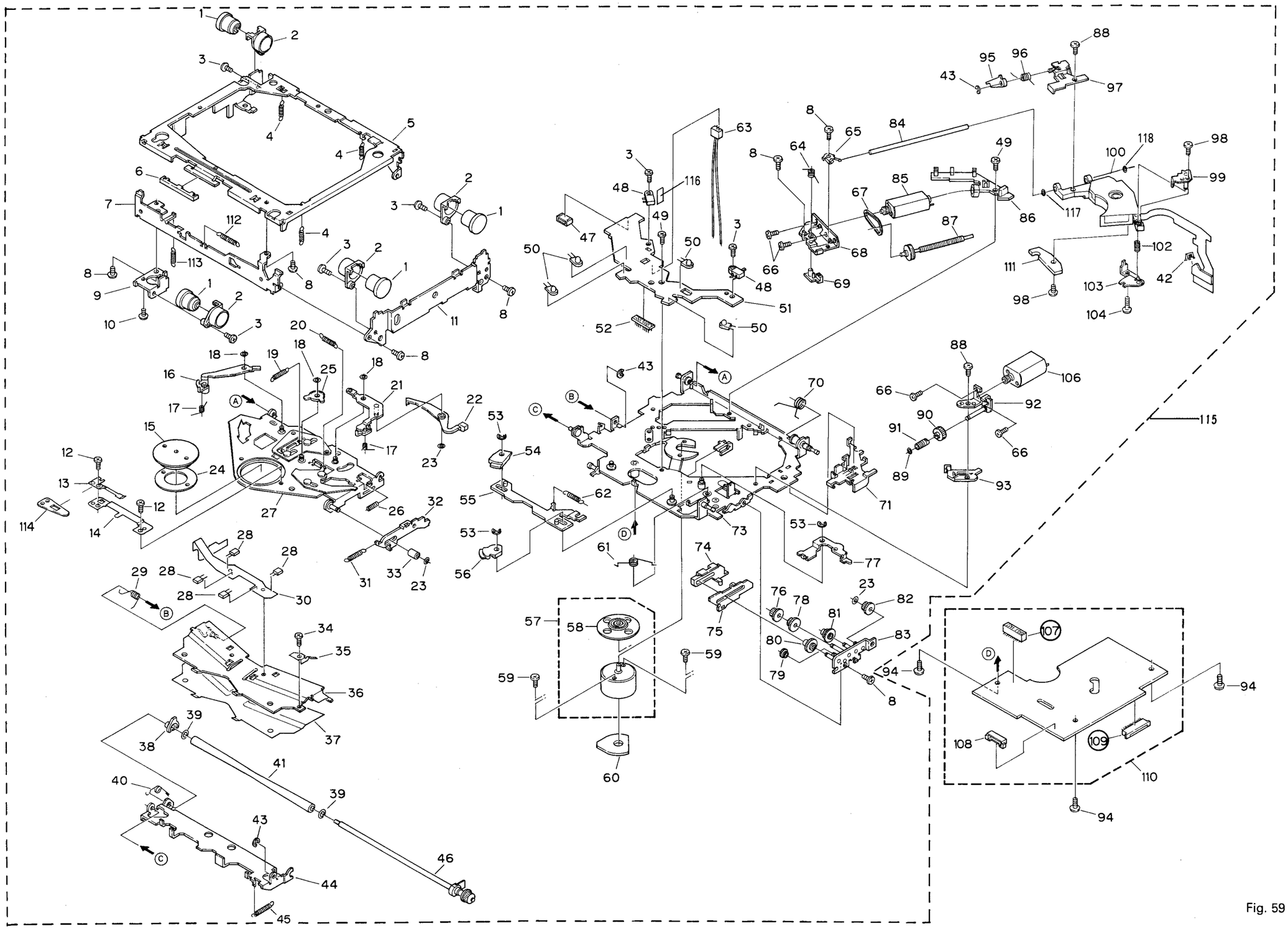


Fig. 59

• Parts List

NOTE:

- *The parts m*
- *subject to re*
- *Because the*
- *not spare pa*

Mark No.	Descr
1	Dampe
2	Holde
3	Screw
4	Sprin
5	Frame
6	Guide
7	Frame
8	Screw
9	Brack
10	Screw
11	Frame
12	Screw
13	Spri
14	Brac
15	Clamp
16	Arm U
17	Sprin
18	Washe
19	Sprin
20	Sprin
21	Arm U
22	Arm
23	Washe
24	Sheet
25	Gear
26	Sprin
27	Arm U
28	Photo
29	Sprin
30	P.C.B
31	Sprin
32	Lever
33	Rolle
34	Screw
35	Sprin
36	Arm U
37	Sheet
38	Holde
39	Washe
40	Sprin

• Parts List

NOTE:

- *The parts marked with "◉" may need long time to supply and their supply is subject to refuse as the case may be.*
- *Because the parts with encircled number shown on the dismantling drawing are not spare parts, we are unable to supply them in principle.*

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Damper	CNV2882	41	Roller	CNV2225
2	Holder	CNV2863	42	Short Pin	CBL1010
3	Screw	CBA1004	43	Washer	YE15FUC
4	Spring	CBH1417	44	Arm	CNC3819
5	Frame	CNC3816	45	Spring	CBH1421
6	Guide	CNV2891	46	Gear Unit	CXA4265
7	Frame	CNC3835	47	Connector (4P)	CKS2088
8	Screw	BMZ20P030FMC	48	Switch (S1, 2)	CSN1012
9	Bracket	CNC3818	49	Screw	CBA1077
10	Screw	BMZ20P040FNI	50	LED (D1-4)	BR4361F
11	Frame	CNC3817	51	Gathering P. C. Board	CNX1759
12	Screw	JFZ20P018FNI	52	Connector (16P)	CKS2064
13	Spring	CBL1131	53	Washer	YE20FUC
14	Bracket	CNC3830	54	Arm	CNV2884
15	Clamper	CNV2864	55	Lever Unit	CXA4269
16	Arm Unit	CXA4271	56	Arm	CNV2885
17	Spring	CBH1415	57	Motor (Spindle)	CXM1058
18	Washer	CBF1039	58	Support Wheel	CNV2859
19	Spring	CBH1418	59	Screw	HBA-258
20	Spring	CBH1419	60	P. C. Board	CNP2720
21	Arm Unit	CXA4272	61	Spring	CBH1414
22	Arm	CNV2876	62	Spring	CBH1424
23	Washer	CBF1038	63	Connector (2P)	CDE3369
24	Sheet	CNM3110	64	Spring	CBH1410
25	Gear	CNV2875	65	Spring	CBL1129
26	Spring	CBH1423	66	Screw	JFZ20P025FMC
27	Arm Unit	CXA4259	67	Belt	CNT1047
28	Photo-transistor	PT4800	68	Bracket	CNC3832
29	Spring	CBH1449	69	Holder	CNV2878
30	P. C. Board	CNP2718	70	Spring	CBH1413
31	Spring	CBH1420	71	Cover	CNV2889
32	Lever	CNC3828	72	Holder	CNV3023
33	Roller	CLA1936	73	Chassis Unit	CXA4258
34	Screw	JFZ20P018FNI	74	Lever	CNV2874
35	Spring	CBL1130	75	Lever	CNC3824
36	Arm Unit	CXA4263	76	Gear	CNV2871
37	Sheet	CNM3111	77	Arm	CNC3833
38	Holder	CNV2866	78	Gear	CNV2872
39	Washer	HBF-132	79	Gear	CNV2883
40	Spring	CBH1412	80	Gear	CNV2873

Mark No.	Description	Part No.	Mark No.	Description	Part No.
81	Gear	CNV2870	101	·····	
82	Gear	CNV2869	102	Spring	CBH1422
83	Bracket Unit	CXA4261	103	Holder	CNC4306
84	Shaft	CLA2027	104	Screw	JGZ20P070FNI
85	Motor Unit (Carriage)	CXA4649	105	·····	
86	Holder	CNV2888	106	Motor Unit (Loading)	CXA4267
87	Screw Unit	CXA4266	107	Connector (CN352)	CKS2063
88	Screw	CBA1082	108	Connector (CN752)	CKS2149
89	Washer	CBF1054	109	Connector (CN351)	CKS2121
90	Gear	CNV2892	110	Control Unit	CWX1454
91	Gear	CNV2868	111	Weight	CNC4116
92	Bracket Unit	CXA4262	112	Spring	CBH1458
93	Holder	CNV2887	113	Spring	CBH1457
94	Screw	PMSZ6P040FMC	114	Spacer	CNM3315
95	Rack	CNV2879	◉ 115	CD Mechanism Unit	CXA4260
96	Spring	CBH1411	116	Cushion	CNT1057
97	Bracket Unit	CXA4264	117	Washer	CBF1055
98	Screw	JFZ17P030FNI	118	Cushion	CNT1058
99	Holder Unit	CXA4606			
100	PU Unit	CGY1020			

13. PACKING METHOD

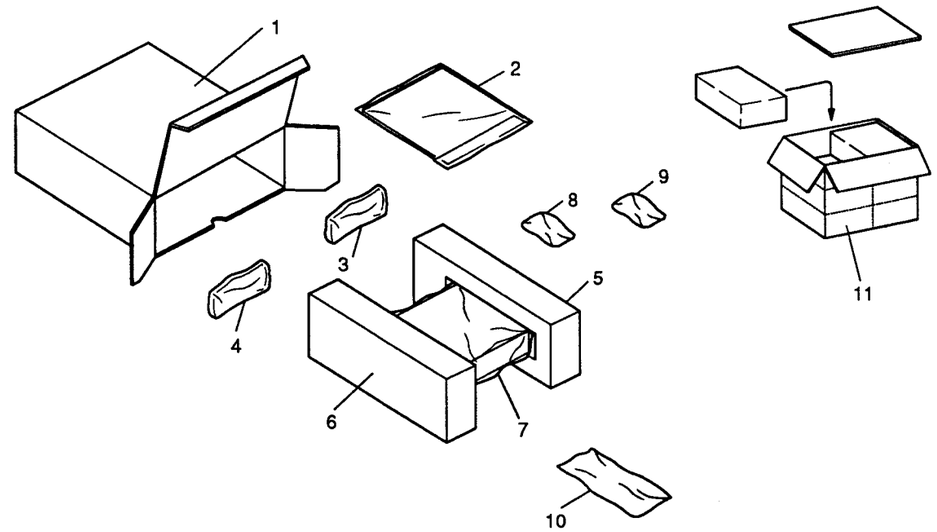


Fig. 60

• Parts List

*:Non spare part

Mark No.	Description	M980RDS/EW Part No.	M980/UC Part No.	M940/ES Part No.	M77/US Part No.	M980RDS/X1B Part No.
1	Carton	CHG2161	CHG2165	CHG2167	CHG2164	CHG2179
2-1	Owner's Manual	CRD1521	CRD1519	CRD1520	CRB1223	CRD1563
2-2	Owner's Manual	CRD1522	·····	·····	·····	·····
* 2-3	Card	CRY-062	ARY1048	·····	ARY1048	CRY-063
* 2-4	Caution Card	CRN1007	·····	·····	·····	CRN1007
* 2-5	Passport	CRY1013	·····	·····	·····	CRY1014
2-6	Polyethylene Bag	E36-618	E36-618	E36-618	E36-618	E36-618
3	Cord	CDE3268	CDE3477	CDE3677	CDE3477	CDE3268
4	Case	CNS2269	CNS2269	CNS2269	CNS2269	CNS2269
5	Styrofoam	CHP1463	CHP1463	CHP1463	CHP1463	CHP1467
6	Styrofoam	CHP1462	CHP1462	CHP1462	CHP1462	CHP1466
7	Cover	CEG1092	CEG1092	CEG1092	CEG1092	CEG-173
8	Remote Control Assy	CXA4419	CXA4421	CXA4419	CXA4420	CXA4419
* 9-1	Battery	CEX1006	CEX1006	CEX1006	CEX1006	CEX1006
9-2	Fastener(Rough)	CNM3249	CNM3249	CNM3249	CNM3249	CNM3249
9-3	Fastener(Soft)	CNM3250	CNM3250	CNM3250	CNM3250	CNM3250
* 9-4	Polyethylene Bag	CEG-127	CEG-127	CEG-127	CEG-127	CEG-127
10	Accessory Assy	CEA1692	CEA1692	CEA1692	CEA1692	CEA1700
11	Contain Box	*CHL2161	CHL2165	*CHL2167	CHL2164	·····

10	Accessory Assy	CEA1692	CEA1700
Mark No.	Description	Part No.	Part No.
* 10-1	Screw Assy	CEA1105	CEA1702
10-1-1	Screw(×1)	CBA-102	CBA-102
10-1-2	Screw(×1)	CBA1002	CBA1002
10-1-3	Nut(×2)	NF50FMC	NF50FMC
*10-1-4	Polyethylene Bag	CEG-127	CEG-127
10-2	Handle	CNC1631	CNC1631
10-3	Strap	CNF-111	CNC2840
10-4	Bush	CNV1917	CNV1917
* 10-5	Polyethylene Bag	CEG-158	CEG1041

2-1, 2-2 Owner's Manual

Part No.	Model	Language
CRD1521	DEH-M980RDS/EW	English, French, German, Spanish
CRD1522	DEH-M980RDS/EW	Swedish, Norwegian, Dutch, Italian, Finnish
CRD1519	DEH-M980/UC	English, French
CRD1520	DEH-M940/ES	English, French, Spanish, Arabic
CRB1223	DEH-M77/US	English
CRD1563	DEH-M980RDS/X1B	English, French, German, Dutch, Italian

14. CHASSIS EXPLODED VIEW

• Parts List (DEH-M980RDS/EW)

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	Battery Cover	CNS2197		46	Arm	CNV2743
	2	Remote Control Assy	CXA4419		47	Arm Unit	CXA4445
	3	Screw	BPZ20P060FMC		48	Arm	CNV2745
	4	P. C. Board	CNP2647		49	Spring	CBH1405
	5	P. C. Board			50	Bracket Unit	CXA4053
	6	Socket	CKS2087		51	Holder Unit	CXA4697
	7	Holder	CNC3716		52	Shaft	CLA1906
	8	Connector	CNV2751		53	Spring	CBH1403
	9	Holder	CNV2749		54	Washer	YE15FUC
	10	Lens	CNV2750		55	Detach Unit	CXA4444
	11	LCD	CAW1140		56	Screw	BMZ20P040FZK
	12	Plug	CKS2360		57	Grille Unit	CXA4055
	13	Holder	CNV2752		58	Screw	BPZ20P100FZK
	14	Lamp	CEL-147		59	Cover	CNS2202
	15	Bush	CNV-724		60	Cover Unit	CXA4483
	16	Lamp (IL903-908)	CEL1013		61	Spacer	CNM3264
	17	Screw	BPZ20P080FMC		62	Lens	CNV2747
	18	Spacer	CNM1642		63	Holder	CNC1484
	19	Display Unit	CWX1397		64	Screw	BMZ26P040FMC
◉	20	Button	CAC2890	◉	65	CD Mechanism Module	CXK2510
	21	Lever	CNV2748		66	Connector Unit	CXA4720
	22	Spring	CBH1407		67	Holder	CNV2893
	23	Button (VOL)	CAC2880		68	Heat Sink	CNR1245
	24	Cushion	CNM3416		69	Screw	BMZ30P140FMC
	25	Button (SHIFT)	CAC2897		70	Earth Plate	CNC4259
	26	Seal	CNM3345		71	IC (IC551)	PA3027A
	27	Grille Unit	CXA4056		72	IC (IC951)	PA2019A
	28	Handle	CNC1631		73	Holder	CNC3707
	29	Button	CAC3054		74	Connector	CKS1534
	30	Button (EJECT)	CAC2881	◉	75	Tuner Amp Unit	CWX1403
	31	Cushion	CNM3362		76	Buzzer (BZ751)	CPV1010
	32	Button (TA)	CAC2883		77	Connector	CKS2149
	33	Button (AF)	CAC2884		78	Insulator	CNM3406
	34	Button (SOURCE)	CAC2882		79	Holder	CNC3850
	35	Button	CAC3053		80	Chassis Unit	CXA4051
	36	Button (1-6)	CAC3052		81	Cord	CDE3270
	37	Case	CNS2269		82	·····	
	38	Screw	BMZ30P050FMC		83	Bracket	CNC3705
	39	Case	CNB1457		84	Connector	CKS2105
	40	Insulator	CNM3193		85	Connector	CKM1091
	41	Spring	CBH1404		86	·····	
	42	Washer	WT22D050D050		87	Plug	CKS1228
	43	Lever	CNC3712		88	Spacer	CNM3343
	44	Arm	CNC3711		89	Holder	CNC3849
	45	Button	CAC2878		90	Transistor (Q968)	2SD1944

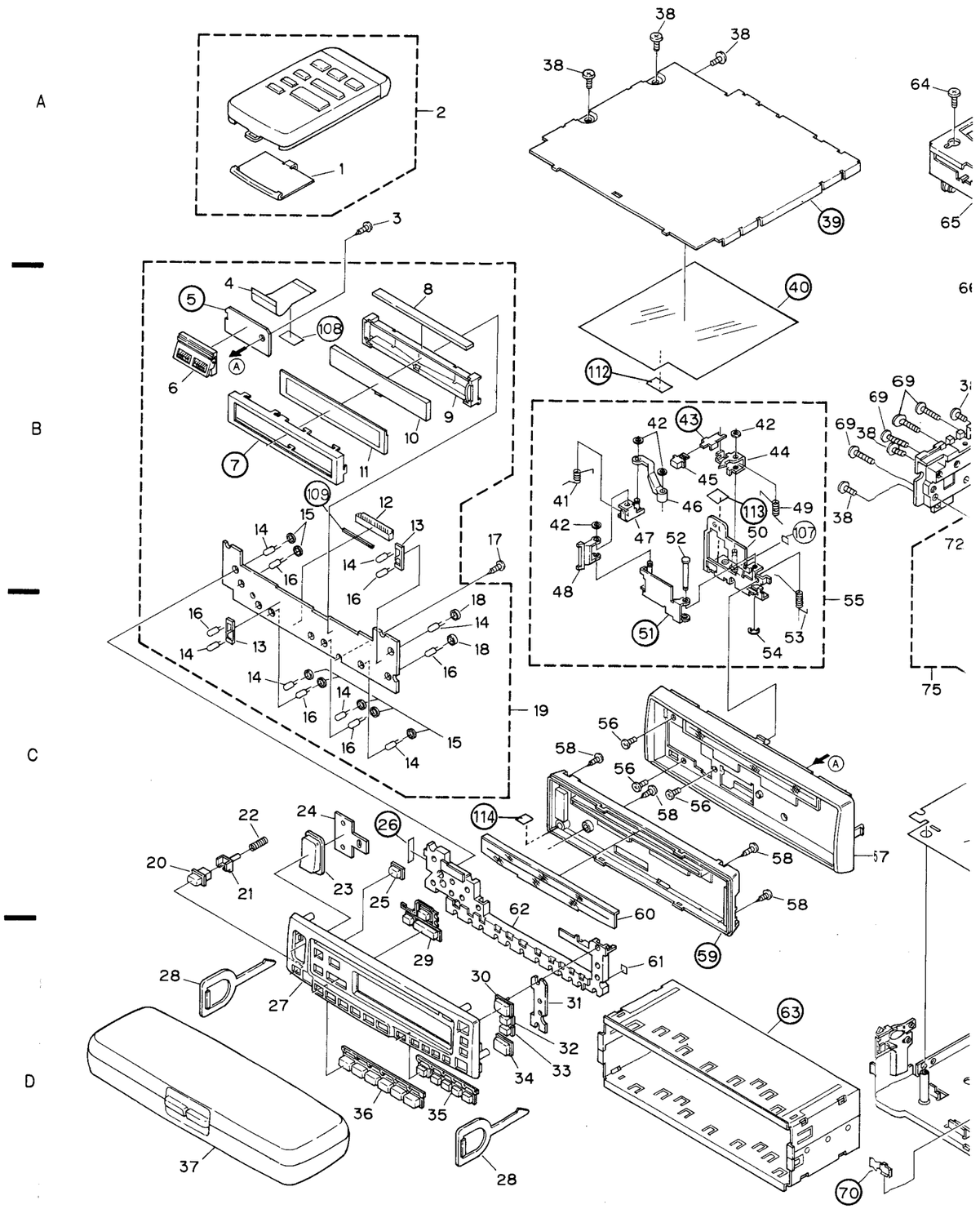
Mark No.	Description	Part No.	Mark No.	Description	Part No.
91	Cord	CDE3268	106	Cap	CNS1472
92	Cap	CNV2680	107	Spacer	CNM3391
93	·····		108	Plate	CNM3367
94	Antenna Cable	CDH1129	109	Spacer	CNM3379
95	Earth Plate	CNC4147	◉ 110	Logic Unit	CWX1480
96	FM/AM Unit	CWE1238	111	Spacer	CNM3395
97	Antenna Jack	CKX1010	112	Spacer	CNM3415
98	Case	CNB1413	113	Spacer	CNM3394
99	Holder	CNC3506	114	Insulator	CNM3398
100	FM Front End	CWB1064	115	Spacer	CNM3392
101	Insulator	CNM2891	116	Spacer	CNM3396
102	Case	CNB1414			
103	Screw	PMS20P060FMC			
104	Resistor	RS1/2P102JL			
105	Fuse(10A)	CEK1136			

Note:

- The DEH-M980/UC, DEH-M940/ES, DEH-M77/US and DEH-M980RDS/X1B Parts Lists enumerate the parts which differ from those enumerated in the DEH-M980RDS/EW Parts List only.
  The parts other than those enumerated in the former are indentical with those in the latter, to which you are requested to refer, accordingly.
  The DEH-M980RDS/EW Parts List is given on page 108.

		M980RDS/EW	M980/UC	M940/ES	M77/US	M980RDS/X1B
Mark No.	Description	Part No.	Part No.	Part No.	Part No.	Part No.
2	Remote Control Assy	CXA4419	CXA4421	CXA4419	CXA4420	CXA4419
11	LCD	CAW1140	CAW1141	CAW1141	CAW1141	CAW1181
16	Lamp(IL903-908)	CEL1013	CEL1025	CEL1025	CEL1025	CEL1013
19	Display Unit	CWX1397	CWX1396	CWX1396	CWX1395	CWX1439
27	Grille Unit	CXA4056	CXA4254	CXA4255	CXA4253	CXA4056
32	Button(TA)	CAC2883	----	----	----	CAC2883
33	Button(AF)	CAC2884	----	----	----	CAC2884
39	Case	CNB1457	CNB1457	CNB1457	CNB1457	CNB1593
40	Insulator	CNM3193	CNM3193	CNM3193	CNM3193	CNM3296
55	Detach Unit	CXA4444	CXA4444	CXA4444	CXA4444	CXA4648
63	Holder	CNC1484	CNC1484	CNC1484	CNC1484	CNC3399
◉ 75	Tuner Amp Unit	CWX1403	CWX1402	CWX1401	CWX1400	CWX1438
80	Chassis Unit	CXA4051	CXA4401	CXA4401	CXA4401	CXA4051
81	Cord	CDE3270	CDE3547	CDE3546	CDE3546	CDE3270
82	Cord	----	----	----	CDE3486	----
83	Bracket	CNC3705	CNC3705	CNC3705	CNC4340	CNC3705
86	Plug	----	----	----	CKS-785	----
91	Cord	CDE3268	CDE3477	CDE3677	CDE3477	CDE3661
92	Cap	CNV2680	CNW-829	CNV2680	CNV2680	CDE2680
93	Cap	----	----	----	CNV2680	----
96	FM/AM Unit	CWE1238	CWE1240	CWE1240	CWE1240	CWE1238
98	Case	CNB1413	----	----	----	CNB1413
100	FM Front End	CWB1064	CWB1063	CWB1063	CWB1063	CWB1064
101	Insulator	CNM2891	----	----	----	CNM2891
102	Case	CNB1414	----	----	----	CNB1414
◉ 110	Logic Unit	CWX1480	----	----	----	CWX1480
111	Spacer	CNM3395	----	----	----	CNM3395

• Chassis



• **Chassis**

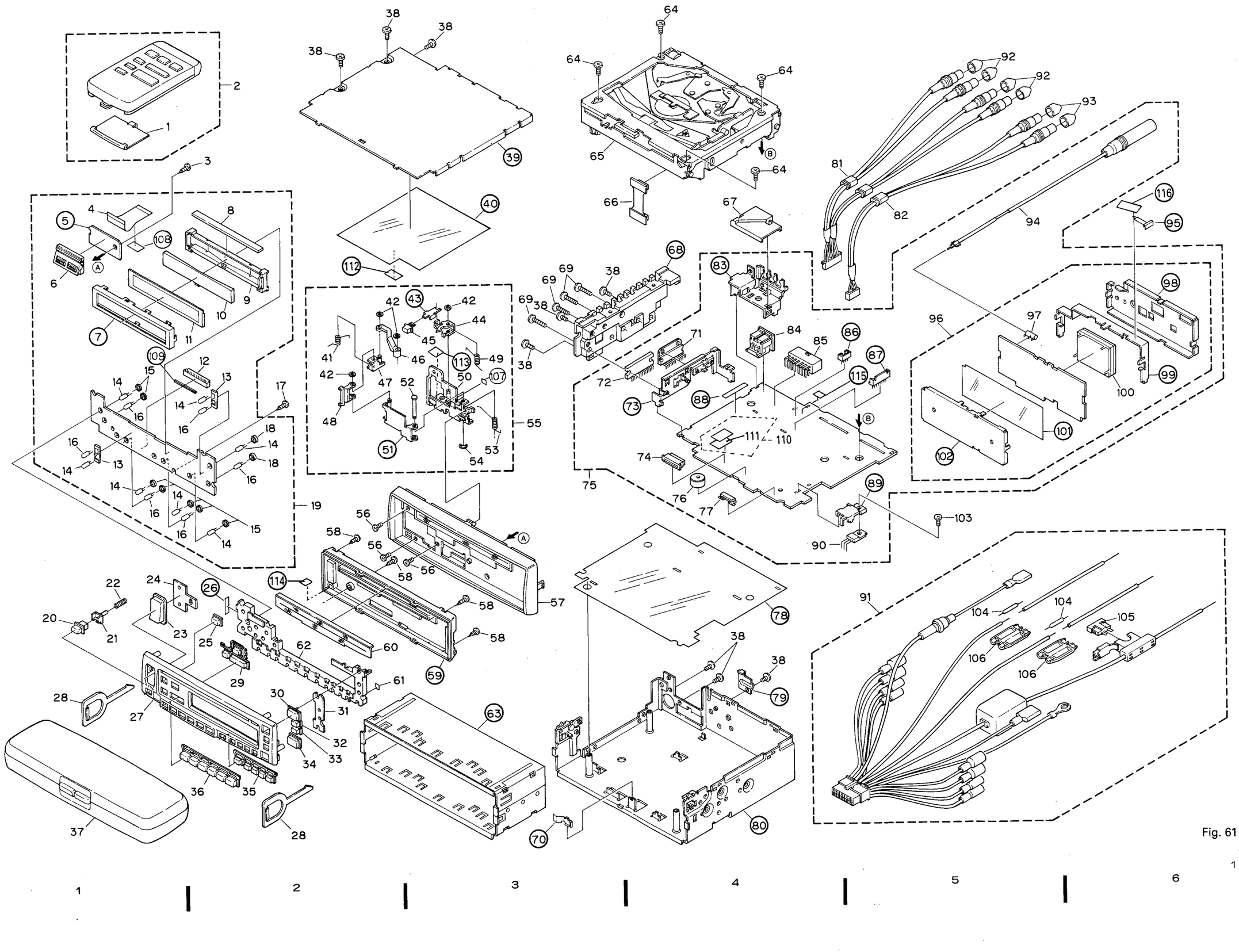


Fig. 61

15. ELECTRICAL PARTS LIST

NOTE:

- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The part numbers shown below indicate chip components.*

Chip Resistor

RS1/□S□□□J,RS1/□□S□□□J

Chip Capacitor (except for CQS.....)

CKS....., CCS....., CSZS.....

Unit Number : CWE1238(M980RDS/EW,X1B)
Unit Name : FM/AM Unit

MISCELLANEOUS

Circuit Symbol & No.	Part Name	Part No.
IC 51		PA4012B
IC 201		PA4018
Q 1 2		DTC124EU
Q 3 71 101 123		2SC4116
Q 51		DTA114TU
Q 121		IMZ1
Q 122		FMS1
Q 201		FC12
Q 203 205		DTC124EU
Q 241		2SC2712
D 51		MA143-MC
D 201 204		MA157-MR
D 205		SVC203CP
L 1 51	Inductor	LYS150K
L 2	Inductor	LPSQR22K
L 71	Inductor	LPSQ3R9K
L 101	Inductor	CTF1126
L 201	Coil	CTB1068
L 202	Coil	CTB1082
L 204	Inductor	CTF1199
L 205	Inductor	CTF1198
L 206	Inductor	CTF1197
L 207	Inductor	CTF1115
T 51	Coil	CTE1062
T 52	Coil	CTE1063
T 71	Coil	CTE1058
T 203	Coil	CTB1076
T 204	Coil	CTE1059
T 205	Coil	CTE1060
T 206	Coil	CTE1061
L 203		LPSQ220K
TH 51 102	Thermister	GGF-928
CF 52 53	Ceramic Filter	CTF1193
CF 201	Ceramic Filter	CTF1192
CF 202	Ceramic Filter	CTF1191
X 151	Ceramic Resonator	CSS1085
X 201	Crystal Resonator	CSS1014
VR 1	Semi-fixed 2.2kΩ(B)	CCP1015
VR 51 101 102	Semi-fixed 33kΩ(B)	CCP1022
SP 1		DSP-201M
	FM Front End	CWB1064

RESISTORS

Circuit Symbol & No.	Part Name	Part No.
R 1 202		RS1/10S681J
R 2		RS1/16S101J
R 3		RS1/16S333J
R 4 75 107		RS1/16S102J
R 5 6 54		RS1/16S472J
R 7		RS1/16S560J
R 8		RS1/16S0R0J
R 9		RS1/16S0R0J
R 56		RS1/16S822J
R 57		RS1/16S472J
R 58		RS1/16S563J
R 59		RS1/16S331J
R 60		RS1/16S473J
R 61 105		RS1/16S332J
R 64 151 152		RS1/16S222J
R 65		RS1/16S273J
R 66		RS1/16S103J
R 72		RS1/16S123J
R 73 124 126		RS1/16S103J
R 74		RS1/16S331J
R 76		RS1/16S221J
R 101		RS1/10S331J
R 102		RS1/16S472J
R 106 128		RS1/16S683J
R 108 122		RS1/16S104J
R 111		RS1/10S123J
R 112		RS1/16S684J
R 121		RS1/10S683J
R 123		RS1/16S683J
R 125		RS1/16S154J
R 127		RS1/16S683J
R 129		RS1/16S473J
R 153		RS1/16S222J
R 201		RS1/16S220J
R 203 206		RS1/16S222J
R 204 213		RS1/16S473J
R 205 209		RS1/16S470J
R 207		RS1/16S822J
R 208 212		RS1/10S103J
R 210		RS1/10S682J
R 211 241 242		RS1/16S103J
R 214		RS1/16S182J
R 243		RS1/10S181J
R 244		RS1/16S561J

CAPACITORS

Circuit Symbol & No.	Part Name	Part No.
C 1 111		CEV100M16
C 2 51 59 74		CKSRYF473Z25
C 3		CCSRCH270J50
C 4 55		CKSRYB102K50
C 5		CKSRYB472K50
C 52 53 61		CKSRYB223K25
C 54		CCSRSL101J50
C 56		CKSRYF104Z25
C 57		CSZSR22M35
C 58		CCSRCH060D50

Circuit Symbol & No.	Part Name	Part No.
C 60		CEVNP100M25
C 72 73 241		CKSRYB103K25
C 75		CKSRYF103Z50
C 101		CKSRYB822K25
C 102		CKSRYB682K25
C 103		CKSRYB272K50
C 105		CSZS2R2M10
C 106		CEVR47M50
C 107 108		CKSRYB222K50
C 110		CEVR22M50
C 112		CKSYB104K25
C 121		CEV4R7M35
C 122		CKSRYB471K50
C 123		CSZS0R1M35
C 151 152		CKSRYB273K16
C 153		CSZSR47M20
C 154 155		CEV3R3M50
C 156		CSZS3R3M10
C 157		CEV101M10
C 158		CKSRYF473Z25
C 201		CKSRYB103K25
C 202 212		CKSRYB332K50
C 203 215 219		CKSRYF473Z25
C 204 208		CKSRYB223K25
C 205		CCSRCH220J50
C 206 207		CCSRCH820J50
C 210		CKSQYF223Z25
C 211		CEV2R2M50
C 213		CCSRCH330J50
C 216		CKSQYF473Z25
C 218		CEVNP2R2M35
C 220		CCSRCH430J50
C 221 231		CCSRCH100D50
C 222		CSZS010M16
C 223		CKSRYF333Z25
C 224 229		CEV470M16
C 225		CKSQYF333Z25
C 226		CKSQYF473Z25
C 227		CEV4R7M35
C 228		CKSQYB103K50
C 230		CEV220M6R3
C 232		CKSRYB102K50
C 240		CKSRYF473Z25
C 242		CEV100M16

Unit Number :
Unit Name : Display Unit

MISCELLANEOUS

Circuit Symbol & No.	Part Name	Part No.
IC 901		GGF-921
IC 902		RS-20
Q 901		2SC3651
D 901 902 903 904 905		MA143-MC
D 906		CL150URCD
D 907		MA3056M
D 910 911 912 913 914 915 916		MA110-1A
L 901	Inductor	CTF1006
X 901		CSS1083
S 901 902 903 904 905 906 907 908 909 910	Switch	CSG1041
S 911 912 913 914 915 916 917 918 919 920	Switch	CSG1041
S 921 922	Switch	CSG1041
IL 901 902 909 910 911 912 913	Lamp 14V40mA	CEL-147
IL 903 904 905 906 907 908	Lamp 14V40mA	CEL1013
	LCD	CAW1140

RESISTORS

Circuit Symbol & No.	Part Name	Part No.
R 901 902 903 904 905		RS1/8S102J
R 906		RS1/8S162J
R 907		RS1/10S121J
R 908 909 910 911 912 913 914 915 916 917		RS1/10S471J
R 918		RS1/10S102J
R 919		RS1/10S221J
R 922		RS1/10S222J

CAPACITORS

Circuit Symbol & No.	Part Name	Part No.
C 901		CEV470M6R3
C 903 904		CCSQCH102J50
C 905		CCSQCH102J50
C 906		CKSQYB103K50

Unit Number :
Unit Name : Tuner Amp Unit(M980RDS/EW,X1B)

MISCELLANEOUS

Circuit Symbol & No.	Part Name	Part No.
IC 501		GGF-919
IC 502		LH5116HN-10T
IC 503 707 708 852 853 952		RC4558M
IC 504		CWV1020
IC 551		PA3027A
IC 704		PMJ001A
IC 751		PD4348C
IC 753		M51955AFP
IC 951		PA2019A
Q 501 504 753 757 758 959 971		UN2211
Q 502		2SC3098
Q 505		2SC3295
Q 506		UN2211
Q 507 517 523 529		2SC2712
Q 511 512 513 514		2SD1781K
Q 515 531 756 951 954 970 983		UN2211
Q 516		2SA1298
Q 518		UN2211
Q 519 520		2SK208
Q 521		2SJ163
Q 522 851		2SA1162
Q 524		DTC124EK
Q 525 957		2SC2712
Q 526		DTA124EK
Q 527		DTC124EK
Q 528		DTC323TK
Q 530 755 969		UN2111
Q 532		2SA1162
Q 701 702 857 858		2SD1781K
Q 706		UN2111
Q 707		UN2211
Q 751		DTC114EK
Q 752		2SD1859
Q 759		UN2111
Q 760		2SA1162
Q 761		2SD601A
Q 855 856		2SD1781K
Q 953 956 958 972 973 974 975		2SB1238
Q 955		UN221D
Q 960		UN2111
Q 961		UN2211
Q 968		2SD1944
Q 982		2SB1238
D 501 958		RD4R7JSB2
D 502		RD2R7ESB2

======Circuit Symbol & No.	Part Name======	Part No.
C 60		CEVNP100M25
C 72 73 241		CKSRYB103K25
C 75		CKSRYF103Z50
C 101		CKSRYB822K25
C 102		CKSRYB682K25
C 103		CKSRYB272K50
C 105		CSZS2R2M10
C 106		CEVR47M50
C 107 108		CKSRYB222K50
C 110		CEVR22M50
C* 112		CKSYB104K25
C 121		CEV4R7M35
C 122		CKSRYB471K50
C 123		CSZS0R1M35
C 151 152		CKSRYB273K16
C 153		CSZSR47M20
C 154 155		CEV3R3M50
C 156		CSZS3R3M10
C 157		CEV101M10
C 158		CKSRYF473Z25
C 201		CKSRYB103K25
C 202 212		CKSRYB332K50
C 203 215 219		CKSRYF473Z25
C 204 208		CKSRYB223K25
C 205		CCSRCH220J50
C 206 207		CCSRCH820J50
C 210		CKSQYF223Z25
C 211		CEV2R2M50
C 213		CCSRCH330J50
C 216		CKSQYF473Z25
C 218		CEVNP2R2M35
C 220		CCSRCH430J50
C 221 231		CCSRCH100D50
C 222		CSZS010M16
C 223		CKSRYF333Z25
C 224 229		CEV470M16
C 225		CKSQYF333Z25
C 226		CKSQYF473Z25
C 227		CEV4R7M35
C 228		CKSQYB103K50
C 230		CEV220M6R3
C 232		CKSRYB102K50
C 240		CKSRYF473Z25
C 242		CEV100M16

Unit Number :
Unit Name : Display Unit

MISCELLANEOUS

IC 901		GGF-921
IC 902		RS-20
Q 901		2SC3651
D 901 902 903 904 905		MA143-MC
D 906		CL150URCD
D 907		MA3056M
D 910 911 912 913 914 915 916		MA110-1A
L 901	Inductor	CTF1006
X 901		CSS1083
S 901 902 903 904 905 906 907 908 909 910	Switch	CSG1041
S 911 912 913 914 915 916 917 918 919 920	Switch	CSG1041
S 921 922	Switch	CSG1041
IL 901 902 909 910 911 912 913	Lamp 14V40mA	CEL-147
IL 903 904 905 906 907 908	Lamp 14V40mA	CEL1013
	LCD	CAW1140

======Circuit Symbol & No.	Part Name======	Part No.
RESISTORS		
R 901 902 903 904 905		RS1/8S102J
R 906		RS1/8S162J
R 907		RS1/10S121J
R 908 909 910 911 912 913 914 915 916 917		RS1/10S471J
R 918		RS1/10S102J
R 919		RS1/10S221J
R 922		RS1/10S222J
CAPACITORS		
C 901		CEV470M6R3
C 903 904		CCSQCH102J50
C 905		CCSQCH102J50
C 906		CKSQYB103K50

Unit Number :
Unit Name : Tuner Amp Unit(M980RDS/EW,X1B)

MISCELLANEOUS

IC 501		GGF-919
IC 502		LH5116HN-10T
IC 503 707 708 852 853 952		RC4558M
IC 504		CWV1020
IC 551		PA3027A
IC 704		PMJ001A
IC 751		PD4348C
IC 753		M51955AFP
IC 951		PA2019A
Q 501 504 753 757 758 959 971		UN2211
Q 502		2SC3098
Q 505		2SC3295
Q 506		UN2211
Q 507 517 523 529		2SC2712
Q 511 512 513 514		2SD1781K
Q 515 531 756 951 954 970 983		UN2211
Q 516		2SA1298
Q 518		UN2211
Q 519 520		2SK208
Q 521		2SJ163
Q 522 851		2SA1162
Q 524		DTC124EK
Q 525 957		2SC2712
Q 526		DTA124EK
Q 527		DTC124EK
Q 528		DTC323TK
Q 530 755 969		UN2111
Q 532		2SA1162
Q 701 702 857 858		2SD1781K
Q 706		UN2111
Q 707		UN2211
Q 751		DTC114EK
Q 752		2SD1859
Q 759		UN2111
Q 760		2SA1162
Q 761		2SD601A
Q 855 856		2SD1781K
Q 953 956 958 972 973 974 975		2SB1238
Q 955		UN221D
Q 960		UN2111
Q 961		UN2211
Q 968		2SD1944
Q 982		2SB1238
D 501 958		RD4R7JSB2
D 502		RD2R7ESB2

======Circuit Symbol & No.	Part Name======	Part No.
D 503		HZM2R7NB1
D 508		MA151WA-MN
D 510 770 967		MA151WK-MT
D 702		MA151WA-MN
D 752 753 754 755 756 757 759 760 766 771		1SS133
D 761 762 763 764 765		MA153-MC
D 767		HZS7A1L
D 769		MA151WK-MT
D 772 773 774 775 777 778 951 966		1SS133
D 853		MA151WA-MN
D 952		RB100AVH
D 953		SM-3-02LFEA
D 954 956		ERA15-02VH
D 955		ERA15-10VH
D 959		1SS133
D 964		HZS9C3L
D 965		MA151WK-MT
D 968		1SS133
D 969		ERA15-02VH
L 502 504 952	Inductor	LPS1R0K
L 503	Inductor	LPS1R0K
L 505	Inductor	CTF1006
L 953 954	Inductor	CTF1006
TC 751	Trimmer	CCL1017
IB 551 552		CWW1338
X 501	Crystal Resonator	CSS1011
X 751	Crystal Resonator	CSS1023
S 751	Switch	CSG1020
VR 502		CCP1136
EF 951		CCG1003
BZ 751	Buzzer	CPV1010
ZN 951	Surge Absorber	ERZ-C07DK220
	FM/AM Unit	CWE1238
RESISTORS		
R 501		RS1/10S563J
R 502 518 563 745 746 747		RS1/10S472J
R 503		RS1/10S331J
R 504 506		RS1/10S101J
R 505		RS1/10S182J
R 507		RS1/10S821J
R 509 513 542 569 817 852 853		RS1/10S222J
R 510		RS1/10S222J
R 511		RS1/10S335J
R 512 519 520 521 532 533 534		RS1/10S102J
R 514 877 878 890 891 951 952		RS1/10S223J
R 515 781		RS1/10S221J
R 516 517 784 787 790 992		RS1/10S103J
R 522 536 537 789 804 823 850 851		RS1/10S222J
R 524 525 970		RS1/10S563J
R 526 527		RS1/10S822J
R 528 529		RS1/10S222J
R 535		RS1/10S152J
R 538 544 773 798 799 814 815		RS1/10S473J
R 539		RS1/10S474J
R 543 568		RS1/10S222J
R 545		RS1/10S104J
R 546		RS1/10S102J
R 547 548 560 561		RS1/10S102J
R 549 550		RS1/10S472J
R 551		RS1/10S334J
R 552		RS1/10S224J
R 553		RS1/10S123J
R 554		RS1/10S334J
R 555		RS1/10S272J

======Circuit Symbol & No.	Part Name======	Part No.
R 556		RS1/10S272J
R 557		RS1/10S393J
R 558		RS1/10S102J
R 559		RS1/10S102J
R 562		RS1/10S224J
R 570		RS1/10S821J
R 585 586		RS1/10S0R0J
R 589 590 591 592		RS1/10S472J
R 597 598 601 602 603 604 606		RS1/10S2R2J
R 599 996		RS1/10S472J
R 605		RS1/10S2R2J
R 607 791 792 793 794 795		RS1/10S471J
R 608		RS1/10S220J
R 609		RD1/4PS2R2JL
R 610		RS1/8S2R2J
R 701 702		RS1/10S133J
R 703 704		RS1/10S153J
R 709 710		RS1/10S113J
R 711 712		RS1/10S133J
R 713 714		RS1/10S513J
R 715 716		RS1/10S223J
R 717 718		RS1/10S222J
R 740		RS1/10S152J
R 741		RS1/10S151J
R 742		RS1/10S151J
R 743		RS1/10S272J
R 744		RS1/10S272J
R 748		RS1/10S103J
R 759		RS1/10S683J
R 760 761 764		RS1/10S473J
R 769 770 772 774		RS1/10S682J
R 771 782 783		RS1/10S103J
R 775 776 777 778 779		RS1/10S221J
R 780		RD1/4PS102JL
R 785 786		RS1/10S332J
R 788		RD1/4PS362JL
R 796		RS1/10S100J
R 803 899		RS1/10S0R0J
R 805 827 828		RS1/10S104J
R 806 807		RS1/10S473J
R 808		RS1/10S473J
R 809		RS1/10S0R0J
R 810		RS1/10S473J
R 825		RS1/10S102J
R 837		RS1/10S563J
R 838		RD1/4PS473JL
R 839		RS1/10S472J
R 840		RS1/10S472J
R 841 842 969		RS1/10S102J
R 854 956 960 994		RS1/10S472J
R 869 870 882 883		RS1/10S182J
R 873 874 886 887 964		RS1/10S472J
R 875 876 888 889		RS1/10S102J
R 953		RS1/10S752J
R 957 965 972 974 976 978		RD1/4PS332JL
R 959		RS1/10S102J
R 961		RD1/4PS472JL
R 973 975 977 981		RS1/10S332J
R 979		RS1/10S103J
R 982		RS1/10S183J
R 990		RD1/4PS471JL
R 991		RD1/4PS221JL
R 993		RS1/10S392J
R 997		RS1/10S560J
R 998		RS1/10S100J
R 999		RD1/4PS152JL

======Circuit Symbol & No.	Part Name======	Part No.
D 503		HZM2R7NB1
D 508		MA151WA-MN
D 510 770 967		MA151WK-MT
D 702		MA151WA-MN
D 752 753 754 755 756 757 759 760 766 771		1SS133
D 761 762 763 764 765		MA153-MC
D 767		HZS7A1L
D 769		MA151WK-MT
D 772 773 774 775 777 778 951 966		1SS133
D 853		MA151WA-MN
D 952		RB100AVH
D 953		SM-3-02LFEA
D 954 956		ERA15-02VH
D 955		ERA15-10VH
D 959		1SS133
D 964		HZS9C3L
D 965		MA151WK-MT
D 968		1SS133
D 969		ERA15-02VH
L 502 504 952	Inductor	LPS1R0K
L 503	Inductor	LPS1R0K
L 505	Inductor	CTF1006
L 953 954	Inductor	CTF1006
TC 751	Trimmer	CCL1017
IB 551 552		CWW1338
X 501	Crystal Resonator	CSS1011
X 751	Crystal Resonator	CSS1023
S 751	Switch	CSG1020
VR 502		CCP1136
EF 951		CCG1003
BZ 751	Buzzer	CPV1010
ZN 951	Surge Absorber	ERZ-C07DK220
	FM/AM Unit	CWE1238

RESISTORS

R 501	RS1/10S563J
R 502 518 563 745 746 747	RS1/10S472J
R 503	RS1/10S331J
R 504 506	RS1/10S101J
R 505	RS1/10S182J
R 507	RS1/10S821J
R 509 513 542 569 817 852 853	RS1/10S222J
R 510	RS1/10S222J
R 511	RS1/10S335J
R 512 519 520 521 532 533 534	RS1/10S102J
R 514 877 878 890 891 951 952	RS1/10S223J
R 515 781	RS1/10S221J
R 516 517 784 787 790 992	RS1/10S103J
R 522 536 537 789 804 823 850 851	RS1/10S222J
R 524 525 970	RS1/10S563J
R 526 527	RS1/10S822J
R 528 529	RS1/10S222J
R 535	RS1/10S152J
R 538 544 773 798 799 814 815	RS1/10S473J
R 539	RS1/10S474J
R 543 568	RS1/10S222J
R 545	RS1/10S104J
R 546	RS1/10S102J
R 547 548 560 561	RS1/10S102J
R 549 550	RS1/10S472J
R 551	RS1/10S334J
R 552	RS1/10S224J
R 553	RS1/10S123J
R 554	RS1/10S334J
R 555	RS1/10S272J

======Circuit Symbol & No.	Part Name======	Part No.
R 556		RS1/10S272J
R 557		RS1/10S393J
R 558		RS1/10S102J
R 559		RS1/10S102J
R 562		RS1/10S224J
R 570		RS1/10S821J
R 585 586		RS1/10S0R0J
R 589 590 591 592		RS1/10S472J
R 597 598 601 602 603 604 606		RS1/10S2R2J
R 599 996		RS1/10S472J
R 605		RS1/10S2R2J
R 607 791 792 793 794 795		RS1/10S471J
R 608		RS1/10S220J
R 609		RD1/4PS2R2JL
R 610		RS1/8S2R2J
R 701 702		RS1/10S133J
R 703 704		RS1/10S153J
R 709 710		RS1/10S113J
R 711 712		RS1/10S133J
R 713 714		RS1/10S513J
R 715 716		RS1/10S223J
R 717 718		RS1/10S222J
R 740		RS1/10S152J
R 741		RS1/10S151J
R 742		RS1/10S151J
R 743		RS1/10S272J
R 744		RS1/10S272J
R 748		RS1/10S103J
R 759		RS1/10S683J
R 760 761 764		RS1/10S473J
R 769 770 772 774		RS1/10S682J
R 771 782 783		RS1/10S103J
R 775 776 777 778 779		RS1/10S221J
R 780		RD1/4PS102JL
R 785 786		RS1/10S332J
R 788		RD1/4PS362JL
R 796		RS1/10S100J
R 803 899		RS1/10S0R0J
R 805 827 828		RS1/10S104J
R 806 807		RS1/10S473J
R 808		RS1/10S473J
R 809		RS1/10S0R0J
R 810		RS1/10S473J
R 825		RS1/10S102J
R 837		RS1/10S563J
R 838		RD1/4PS473JL
R 839		RS1/10S472J
R 840		RS1/10S472J
R 841 842 969		RS1/10S102J
R 854 956 960 994		RS1/10S472J
R 869 870 882 883		RS1/10S182J
R 873 874 886 887 964		RS1/10S472J
R 875 876 888 889		RS1/10S102J
R 953		RS1/10S752J
R 957 965 972 974 976 978		RD1/4PS332JL
R 959		RS1/10S102J
R 961		RD1/4PS472JL
R 973 975 977 981		RS1/10S332J
R 979		RS1/10S103J
R 982		RS1/10S183J
R 990		RD1/4PS471JL
R 991		RD1/4PS221JL
R 993		RS1/10S392J
R 997		RS1/10S560J
R 998		RS1/10S100J
R 999		RD1/4PS152JL

Circuit Symbol & No.	Part Name	Part No.
CAPACITORS		
C 501		CEA470M6R3LL
C 502		CEA101M16LL
C 503 504 544 571 572 575 576		CKSQYB102K50
C 505 506		CEA4R7M50LL
C 507 508		CCSQCH101J50
C 509		CCSQCH470J50
C 510 511 512 513 519 527 540 560 753		CKSQYB103K50
C 514		CEAR47M50LL
C 515 956		CKSQYB103K50
C 516 517 529 530 541 951 957 975		CKSQYB473K25
C 518 538 539		CEA4R7M50LL
C 520 761		CEA470M25LL
C 528		CKSQYB223K50
C 531		CEAR22M50LL
C 532		CKSYB224K25
C 533 534		CCSQCH100D50
C 535		CKSQYB102K50
C 536		CKSQYB683K25
C 537		CKSYB224K25
C 542		CEA221M6R3LL
C 543		CCSQCH681J50
C 545 546		CCSQCH151J50
C 547		CKSQYB103K50
C 548		CKSYB104K25
C 549 955 972 973		CKSYB104K25
C 550 552		CEA100M35LL
C 557 558		CKSQYB102K50
C 561 562 563 564 565 566 567 568		CKSYB104K25
C 569		CKSYB104K50
C 573		CEHAQ100M50
C 574		CKSYB104K50
C 577 578		CEA330M10LL
C 579 580		CEA330M10LL
C 593		CFTNA474J50
C 595		CEA101M6R3LL
C 596		CKSQYB103K50
C 597		CKSQYB473K50
C 598		CASA680K10
C 599		CCSQCH470J50
C 611 612		CCSQCH101J50
C 613		CCSQCH221J50
C 701 702		CEA330M10LL
C 703 704		CCSQCH101J50
C 705		CKSQYB472K50
C 715 716 850 851 852 853		CCSQCH470J50
C 717 719 720 722		CEA330M10LL
C 718		CKSQYB472K50
C 752		CKSQYB102K50
C 754		CKSYB104K25
C 755		CCSQCH150J50
C 758		CKSQYB472K50
C 759 760 963 967 971 986 987 988		CKSQYB473K25
C 762 961		CKSQYB103K50
C 763 764 952		CEA010M50LL
C 765		CKSQYB822K50
C 766		CKSQYB822K50
C 767 768		CEA4R7M50LL
C 769 770 783		CEA2R2M50LL
C 771 772		CKSQYB333K25
C 773 774		CKSYB224K25
C 775 776		CKSQYB332K50
C 777 778		CKSQYB183K25
C 779 780		CCSQCH221J50
C 781 782 860 861 867 868		CEA330M10LL
C 784 791 792		CEA100M35LL
C 786		CKSQYB473K25
C 793		CKSQYB102K50
C 869 870 876 877		CEA330M10LL
C 953 954	3300 μF/16V	CCH1125
C 959 985		CEHAQ470M25
C 960 964 966 978		CEHAQ101M10
C 965		CKSQYB473K25
C 969 989	1000 μF/16V	CCH1003
C 970		CEHAQ470M25
C 974		CEA100M35LL
C 982		CKSQYB472K50
C 984		CEHAS470M16
C 990		CEA330M10LL
C 991		CKSQYB473K50

Unit Number : CWX1454
Unit Name : Control Unit

Circuit Symbol & No.	Part Name	Part No.
MISCELLANEOUS		
IC 351		UPC1347GS
IC 601		UPD6374GH
IC 602		RC4558M
IC 651		PA3026
IC 653		M5218FP
IC 701		UPD6375GC
IC 702		TC9237F
IC 703		TA2009F
IC 751		PD5156C
IC 752		MB3854PF
Q 351		2SB1260
Q 601		2SB709A
Q 651		2SB1184F5
Q 652		2SB1184F5
Q 654 705		DTC114EK
Q 701 702		DTC323TK
Q 703		DTC114EK
Q 704		DTA114EK
Q 752		DTA114EK
Q 753		DTA114EK
Q 754		DTC114EK
Q 755		2SD1760F5
Q 756		2SD1030
D 651		SC016-2
D 652		SC016-2
D 701		MA151WA-MN
D 751		MA151A-MA
D 757		HZM6R8NB2
D 758		MA151A-MA
L 601 602 603 604 751	Inductor	CTF1082
L 701	Inductor	CTF1082
TH 752	Thermister	CCX1007
X 701	Crystal Resonator	CSS1067
X 751		CSS1084
VR 351	Semi-fixed 22kΩ(B)	CCP1156
VR 352 355	Semi-fixed 47kΩ(B)	CCP1158
VR 353 354	Semi-fixed 2.2kΩ(B)	CCP1150
VR 356	Semi-fixed 22kΩ(B)	CCP1156
RESISTORS		
R 351		RS1/2S220J
R 352 372		RS1/16S472J
R 353		RS1/16S623J
R 354 757 758 779		RS1/16S473J
R 355		RS1/16S122J
R 356		RS1/16S683J
R 357		RS1/16S683J
R 358		RS1/16S332J
R 359		RS1/16S332J
R 360		RS1/16S684J

======Circuit Symbol & No. Part Name======	Part No.
R 361	RS1/16S153J
R 364	RS1/16S102J
R 369	RS1/16S103J
R 371 373	RS1/16S223J
R 374	RS1/16S912J
R 375 377 713	RS1/16S102J
R 379	RS1/16S513J
R 380	RS1/16S104J
R 381	RS1/16S133J
R 382	RS1/16S133J
R 601 602 603 604 605 607 610	RS1/16S103J
R 606	RS1/16S224J
R 609	RS1/16S102J
R 611 612 665	RS1/16S102J
R 613	RS1/16S102J
R 614	RS1/16S472J
R 615	RS1/16S472J
R 616	RS1/16S102J
R 651 653 701 702 706 711 712 764	RS1/16S102J
R 652	RS1/16S162J
R 654	RS1/16S162J
R 655	RS1/16S752J
R 656	RS1/16S362J
R 657	RS1/16S162J
R 658	RS1/16S102J
R 663	RS1/10S181J
R 664 753 755	RS1/16S103J
R 669 703 797	RS1/16S103J
R 670	RS1/10S151J
R 675	RS1/16S913J
R 676	RS1/16S913J
R 677 681	RS1/16S0R0J
R 679	RS1/16S102J
R 680	RS1/16S0R0J
R 683	RS1/16S0R0J
R 684	RS1/16S102J
R 707 708	RS1/16S223J
R 715	RS1/16S0R0J
R 717	RS1/16S301J
R 719 789	RS1/16S0R0J
R 721	RS1/16S472J
R 722	RS1/16S162J
R 724	RS1/10S1R0J
R 725	RS1/16S472J
R 751	RS1/10S1R0J
R 752	RS1/16S183J
R 754 776	RS1/16S472J
R 756 771 772 773	RS1/16S222J
R 765 793	RS1/16S102J
R 766	RS1/16S473J
R 767 768 769 770	RS1/16S104J
R 774	RS1/16S102J
R 775	RS1/16S104J
R 778	RS1/16S103J
R 780	RS1/16S104J
R 781 782	RS1/16S362J
R 783 784 785 786 787	RS1/16S681J
R 788	RS1/16S102J
R 791 792	RS1/16S391J
R 794	RS1/16S151J
R 799	RS1/10S1R5J

CAPACITORS

C 351	CEV470M16
C 352	CKSQYB104K25
C 353 709	CEV101M6R3
C 354 355	CSZSR4R7M10
C 357 359 366	CKSRYB102K50

======Circuit Symbol & No. Part Name======	Part No.
C 358	CKSRYB331K50
C 360	CKSRYB271K50
C 361	CCSRCH220J50
C 367	CKSYB154K25
C 368	CKSQYB104K25
C 369 373 604 606 703 704	CKSYB224K25
C 370	CKSQYB473K50
C 601	CKSRYB222K50
C 602	CKSRYB222K50
C 603	CKSRYB331K50
C 605	CKSYB103K25
C 607 654 759 760	CKSYB224K25
C 608	CSZS010M16
C 609 610 761	CEV100M16
C 611 701 707 710	CKSRYB103K25
C 651 702 708	CEV101M6R3
C 652	CKSYB224K25
C 655 668	CKSRYB391K50
C 658 470 μF/10V	CCH1120
C 662 665	CEV101M10
C 666	CKSQYB102K50
C 670	CKSQYB273K50
C 671	CKSRYB103K25
C 672	CKSQYB473K25
C 705 706	CCSRCH090D50
C 712	CEV470M6R3
C 713 714	CKSRYB561K50
C 715	CCSRCH100D50
C 716	CEV100M16
C 722 723	CEV4R7M35
C 724	CCSRCH151J50
C 726	CCSRCH100D50
C 727 728	CKSRYB103K25
C 751 752	CCSRCH221J50
C 753 754 755	CCSRCH221J50
C 756	CKSRYB472K50

Unit Number :
Unit Name : Switch P.C.Board

D	1	2	3	4		BR4361F
M	1				Motor(Spindle)	CXM1058
M	2				Motor Unit(Carriage)	CXA4649
M	3				Motor Unit(Loading)	CXA4267
S	1	2			Switch(Home,Clamp)	CSN1012

Unit Number :
Unit Name : Detector P.C.Board

P	1	2	3	4	Photo Transistor	PT4800

Miscellaneous Parts List

======Circuit Symbol & No. Part Name======	Part No.
Fuse10A	CEK1136
PU Unit	CGY1020

Unit Number :
Unit Name :Logic Unit (M980RDS/EW,X1B)

Miscellaneous Parts List

======Circuit Symbol & No. Part Name======	Part No.
IC 1	UPD4538BG
Q 1	UN2111
D 1	MA151WK-MT
D 2	MA151K-MH
R 1	RS1/10473J
C 1	CSZS010M16
C 2	CKSQYB103K50

- The DEH-M980/UC, DEH-M940/ES, DEH-M77/US and DEH-M980RDS/X1B Parts Lists enumerate the parts which differ from those enumerated in the DEH-M980RDS/EW Parts List only.
  The parts other than those enumerated in the former are indentical with those in the latter, to which you are requested to refer, accordingly.
  The DEH-M980RDS/EW Parts List is given on page 112.

Tuner Amp Unit

	M980RDS/EW, X1B	M980/UC	M940/ES	M77/US
IC501	GGF-919	GGF-927	GGF-927	GGF-927
IC502	LH5116HN	----	----	----
IC504	CWV1020	----	----	----
IC701	----	----	----	TC9213P
IC702	----	----	----	TC4052BF
IC710 712	----	----	----	RC4558M
Q506 961	UN2211	----	----	----
Q518	UN2211	----	----	----
Q521	2SJ163	----	----	----
Q522	2SA1162	----	----	----
Q523 529	2SC2712	----	----	----
Q524	DTC124EK	----	----	----
Q525	2SC2712	----	----	----
Q526	DTA124EK	----	----	----
Q527	DTC124EK	----	----	----
Q528	DTC323TK	----	----	----
Q708	----	----	----	2SD1781K
Q760	2SA1162	2SA1162	----	2SA1162
Q960	UN2111	----	----	----
D703	----	----	----	MA151WK-MT
D966 968	1SS133	1SS133	----	1SS133
VR502	CCP1136	----	----	----
R511	RS1/10S335J	----	----	----
R537	RS1/10S222J	----	----	----
R538	RS1/10S473J	----	----	----
R539	RS1/10S474J	----	----	----
R540	----	----	----	----
R541	----	----	RS1/10S0R0J	----
R551	RS1/10S334J	----	----	----
R552	RS1/10S224J	RS1/10S224J	----	----
R553	RS1/10S123J	----	----	----
R554	RS1/10S334J	----	----	----
R555 556	RS1/10S272J	----	----	----
R557	RS1/10S393J	----	----	----
R559	RS1/10S102J	----	----	----
R575	----	RS1/10S0R0J	RS1/10S0R0J	RS1/10S0R0J
R607	RS1/10S471J	----	----	----
R608	RS1/10S220J	----	----	----
R705 706	----	----	----	RS1/10S682J
R707 708 719	----	----	----	RS1/10S473J

	M980RDS/EW, X1B	M980/UC	M940/ES	M77/US
R724	----	----	----	RS1/10S104J
R721 725	----	----	----	RS1/10S104J
R726 735	----	----	----	RS1/10S474J
R727	----	----	----	RS1/10S203J
R728 736	----	----	----	RS1/10S243J
R729	----	----	----	RS1/10S123J
R730 733	----	----	----	RS1/10S153J
R731	----	----	----	RS1/10S822J
R732 734	----	----	----	RS1/10S103J
R739	----	----	----	RS1/10S391J
R749	----	----	----	RS1/10S223J
R756-758	----	----	----	RS1/10S102J
R765	----	----	----	RS1/10S222J
R798	RS1/10S473J	RS1/10S473J	----	RS1/10S473J
R799	RS1/10S473J	----	RS1/10S473J	----
R800	----	----	----	RS1/10S473J
R801	----	----	RS1/10S0R0J	----
R802	----	RS1/10S0R0J	----	RS1/10S0R0J
R803	RS1/10S0R0J	RS1/10S0R0J	RS1/10S0R0J	----
R839 840	RS1/10S472J	RS1/10S472J	----	RS1/10S472J
R898	----	----	----	----
R982	RS1/10S183J	RS1/10S183J	----	RS1/10S183J
C501	CEA470M6R3LL	----	----	----
C502	CEA101M16LL	----	----	----
C514	CEAR47M50LL	----	----	----
C528	CKSQYB223K50	----	----	----
C541 965	CKSQYB473K25	----	----	----
C542	CEA221M6R3LL	----	----	----
C547	CKSQYB103K50	----	----	----
C548	CKSYB104K25	----	----	----
C549	CKSYB104K25	----	----	----
C550	CEA100M35LL	----	----	----
C559	----	----	----	----
C721 724 729 732 735	----	----	----	CEA100M35LL
C726-728	----	----	----	CKSYB224K25
C730	----	----	----	CEAR47M50NPLL
C733	----	----	----	CKSYB273K25
C978	CEHAQ101M10	----	----	----

FM/AM Unit

	M980RDS/EW, X1B	M980/UC	M940/ES	M77/US
FM/AM Unit	CWE1238	CWE1240	CWE1240	CWE1240
Q51	DTA114TU	----	----	----
D51	MA143-MC	----	----	----
CF52 53	CTF1193	CTF1247	CTF1247	CTF1247
R58	RS1/16S563J	RS1/16S473J	RS1/16S473J	RS1/16S473J
R60	RS1/16S473J	----	----	----
R61	RS1/16S332J	----	----	----
R65	RS1/16S273J	----	----	----
R101	RS1/10S331J	RS1/10S471J	RS1/10S471J	RS1/10S471J
R104	----	RS1/16S563J	RS1/16S563J	RS1/16S563J
R151 152	RS1/16S222J	RS1/16S152J	RS1/16S152J	RS1/16S152J
C101	CKSRYB822K25	CKSRYB392K50	CKSRYB392K50	CKSRYB392K50
C104	----	CKSRYB103K25	CKSRYB103K25	CKSRYB103K25
C110	CEVR22M50	CEV010M50	CEV010M50	CEV010M50
C112	CKSYB104K25	CSZSR47M20	CSZSR47M20	CSZSR47M20
C151 152	CKSRYB273K16	----	----	----
C161 162	----	CKSQYB563K25	CKSQYB563K25	CKSQYB563K25
FM Front End	CWB1064	CWB1063	CWB1063	CWB1063

Display Unit

	M980RDS/EW	M980/UC	M940/ES	M77/US	M980RDS/X1B
LCD	CAW1140	CAW1141	CAW1141	CAW1141	CAW1181
IL903-908	CEL1013	CEL1025	CEL1025	CEL1025	CEL1013
S905 915	CSG1041	----	----	CSG1041	CSG1041
D910	MA110-1A	----	----	----	MA110-1A
D906	CL150URCD	CL150URCD	CL150URCD	CL150URCD	CL150RCD

16. CIRCUIT DESCRIPTION

1. Preamplifier Stage

This unit processes a pickup output signal to make signals for subsequent stages, i.e. servo unit, modulator unit and control unit. The signal from the pickup is converted on an I-V basis in a photodetector-builtin preamplifier inside the pickup.
Besides, an addition is made to the signal in an RF amplifier (IC351) to obtain RF, FE and TE signals.
The preamplifier unit has a configuration with one-chip IC UPD1347GS mainly employed. It is described in detail below.
The present system, which is of single power (+5 V) type, has 2.5 volts available for both RF Amplifier Reference Voltage Vref and other signal circuit reference voltage REFOUT. Voltages referred to below are to be expressed in Unit [REFOUT]. (A voltage based on a reference value of 0 (V) is to be expressed in Unit [V] .)
The IC is a 36-pin flat package, which has an internal configuration as shown in Fig. 62.
This IC is described below concerning its internal component parts.
(NOTE) Pin ⑱ on IC351 has Vref (2.5 V), which in turn serves as the reference voltage in the RF amplifier. For measurements, adjustments, etc., apply REFOUT obtained by passing REFO of Pin ⑲ on IC601 through a buffer.

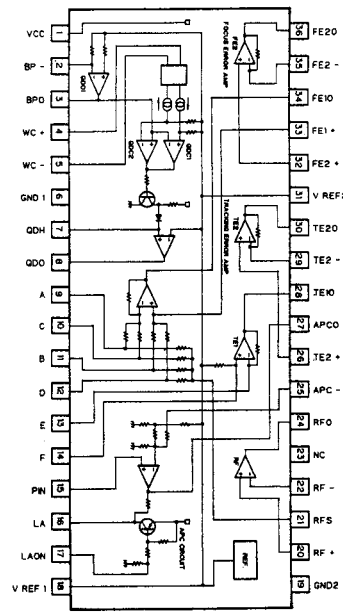


Fig.62 Block diagram

(1) RF amplifier

Photodetector Outputs A, B, C and D are added in amplifier (1) so that (A + B + C + D) will be outputted to RFO. (This terminal permits an eye pattern to be checked.) RFO output voltage VRFO has lowfrequency components as follows:

VRFO [REFOUT] =
−[(R358 + R353)/10 k] × (A + B + C + D)

For RFO output (Pin ㉔, an RF output at a level of VRFO= 1.9 Vp-p', AC., is available, with REFOUT at the center.

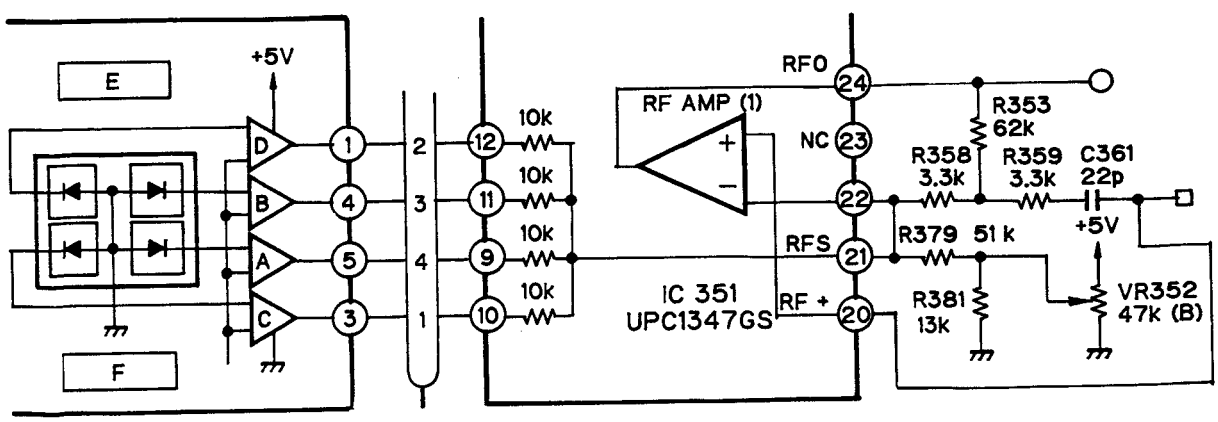


Fig.63 Block diagram

(2) Focus error amplifier

Photodetector outputs A, B, C and D are inputted to both differential and focus-error amplifiers so that A + C − B − D will be outputted.
An FE output volatage (low frequency) will be :

$V_{FE} = 5 \times 25\ k/R_A \times (A + C - B - D)$[REFOUT]

An FE output (Pin ㊱) of about 2.5 (V) is available as an S-shaped curve.

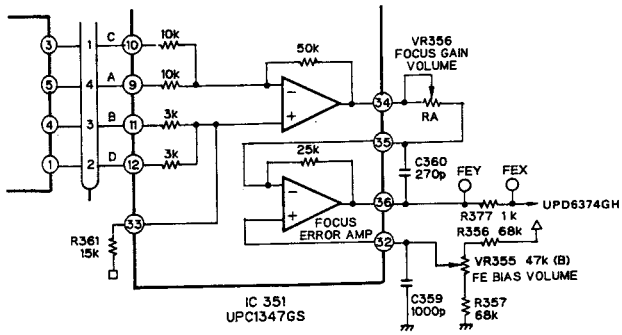


Fig.64 Focus error amplifier

(3) Tracking error amplifier

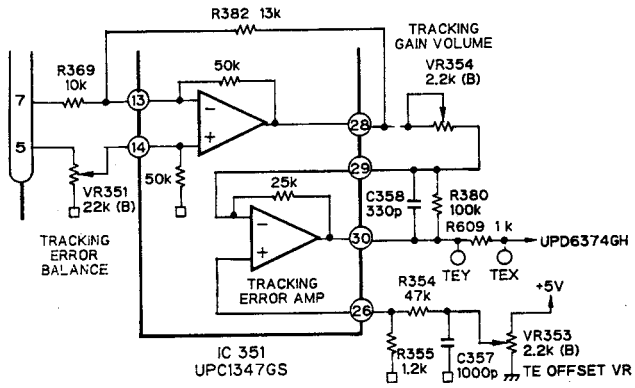


Fig.65 Tracking error amplifier

The side-spot voltages inputted to E and F are amplified in differential and tracking-error amplifiers so that an output (E-F) can be obtained.

$V_{TE} =$
$50\ k//13\ k\ /10\ k \times 100\ k//25\ k\ /R_B \times (E-F)$ [REFOUT]

The TE offset VR, moreover, is to cancel a DC offset from the preamplifier to the servo amplifier while the TE balance VR is to adjust the tracking signal symmetry. These are the prerequisites to mainly perform an operation of tracking normally. A tracking error of approximately 2 (v) p-p' is available as an output of pin ㉚.

(4) APC circuit

A laser diode, if driven at a constant current, will have a negative temperature curve with a large optical output. It is necessary, therefore, to control the current with a monitor photodiode so that a constant output will be available. This is an APC circuit. The present system has LDI set to approximately 50 thru 60 mA.

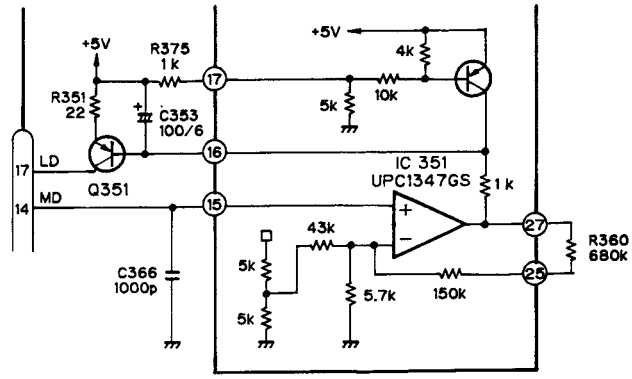


Fig.66 APC circuit

2. Servo Stage

This unit has FE, TE and RF outputs received as its inputs from the RF amplifier. And the analog signals are converted to the digital ones, which are in turn used to execute the servo operations of focus tracking, carriage and spindle and the servo control of in-focus track jump, etc. subject to an instruction from the system microcomputer. IC UPD6374GH (48 pins, flat package) is mainly employed, with the block diagram given in Fig. 67. In addition, this IC has an automatic sequencer built in to perform track jumps, etc; based on the serial data transferred from the system microcomputer. The servo unit is described below on a component by component basis.

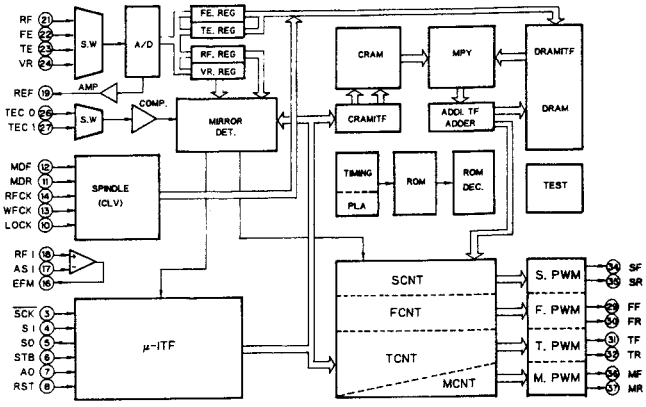
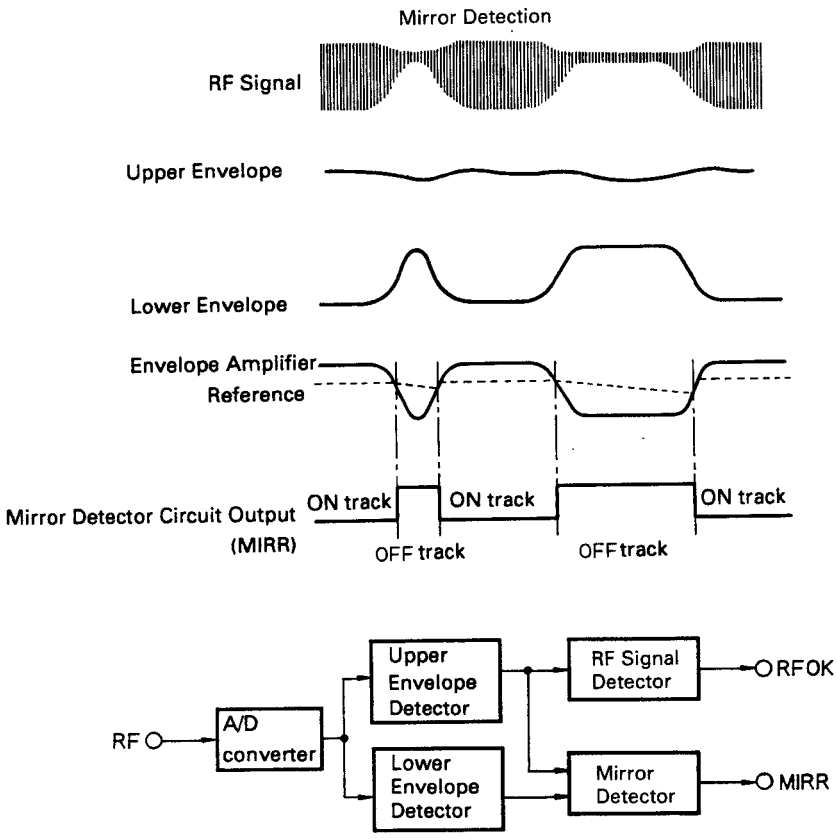


Fig. 67 UPD6374GH Block diagram

(1) Mirror circuit

The mirror detector circuit is to determine an on-track or off-track status by detecting a mirror status, with an envelope amplitude extracted from an RF signal. For the reference to detect a lack of amplitude, the envelope amplitude is held at the peak with a sufficient large time constant and multiplied by two-thirds to obtain the reference value. Should an RF signal have no amplitude available (with the focus servo removed), the mirror detector circuit has an output (MIRR) go "H."



RF detector / mirror detector circuit block diagram

Fig. 68 Mirror circuit

(2) Focus OK circuit

The FOK circuit compares the upper envelope of an RF signal with the value set by the microcomputer and outputs a result of such comparison at the FOK terminal. ("H" is outputted, with [RF signal's upper envelope] > [set value].)

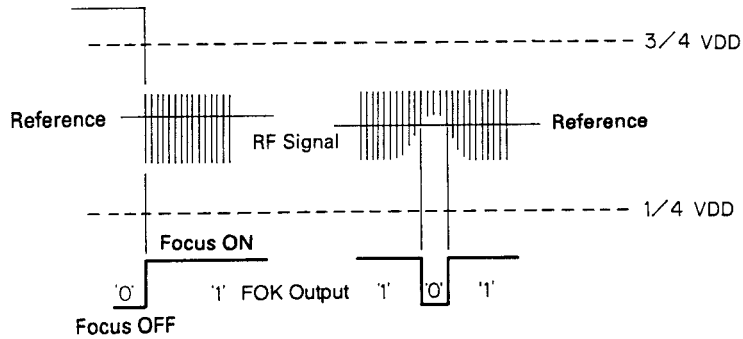


Fig. 69

(3) EFM comparator

The EFM comparator is to digitize an RF signal. Since its error rate increases under the influence of an asymmetry generated, the EFM output signal is made to pass through a low-pass filter by making use of the fact that a bit is generated at a probability of 50 %. And the signal so filtrated is taken for a comparison level. The present system has a low-pass filter cut off fc = 3.3 (Hz) for C604 and R606 and fc = 1.6 (kHz) for C605 and R607.

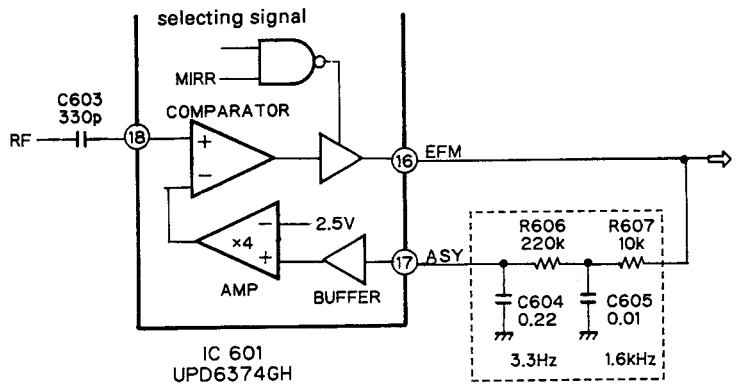


Fig. 70 EFM comparator

(4) Command code

A list of the commands used in the present system is given below.

10H	SK	TM	TEH	FR	TK	TB	T CNT	BRK
11H	FON	TON	SON	MON	FST	DFCT	JSK	TAB
12H	SLED NON-SENSITIVE AREA				HSL	SCV	RFP	TFP
13H	FOK LEVEL				FSPV 1	FSPV 0	T1	T0
14H	00 (h)							
15H	0	0	0	0	0	TCS	CV2	E3EN
16H	0	0	0	0	FPW	TPW	SPW	MPW

20H	TRACK KICK LEVEL a				
21H	TRACK KICK LEVEL b				
22H	TRACK KICK TIME A				
23H	TRACK KICK TIME B / TRAVERSE COUNTER N (H)				
24H	TRAVERSE COUNTER N (L)				
25H	SLED KICK LEVEL	SL1	SL0	0	0

<Description of Functions>

SK: sled kick control; the sled is kicked at a value set in 25 H, when SK is set to "1."

TM: tracking mute control
With TM = "1," the tracking output is put by TEH into either PRECEDING VALUE HOLD or REFERENCE HOLD (Data 00 value) mode.
With TM "0," a result of tracking and filtration is outputted (in the normal mode).

TEH: error hold control upon track jump
With SK = TM = "1," the tracking output has PRECEDING VALUE HOLD or REFERENCE HOLD mode selected.
REFERENCE HOLD, with TEH = "0" and PRECEDING VALUE HOLD, with TEH = "1"

FR: output level polarity control upon tracking and upon sled kicking
With FR = "0," a value available at output level registers (20,21 and 25 H) is multiplied by -1 and outputted.
With FR = "1," an output level register is outputted unchangedly.

TK: controlling both track jump trigger and traverse counter load; it has two meanings according to the T. CNT bit.
With T.CNT = "0," set the TK bit to "1" and the track jump sequencer will start.
With T.CNT = "1," set the TK bit to "1" and the traverse counter will be loaded with Values 23 H and 24 H.

BRK: half-wave brake circuit control
With BRC = "1," the half-wave brake is ON.

TB: selecting a tracking filter coefficient bank:
With TB = "0," the tracking filter bank goes 0.
With TB = "1," the tracking filter bank goes 1.
FON, TON, SON and MON: servo output (PWM output) on/off control
With any = "1," the PWM output is on.
With any = "0," the PWM output has stopped.
With PWM output stopped, a high impedance is outputted with the PWM in the single-phase 3-value output mode.

FST: focus search control
With FST = "1," a focus search will be started if FON = 1.

DFCT: tracking output hold control with flaw detected
With DFCT = "1," the tracking hold is outputted upon detection of flaw.

JSK: sled kick control upon jump
With JSK = "1," the sled is kicked at a level set in 25 H for a duration of the track jump.

TAB: track jump sequencer operation abort control
With TAB = "1," the track jump sequencer stops operating.
SLED NON-SENSITIVE AREA: A sled dead zone is controlled at an absolute vale of 4 bits.

HSL: selecting the tracking output hold control
With HSL = "0," the tracking output hold is controlled by a missing FOK signal.
With HSL = "1," the tracking output hold is controlled by means of an external hold.

SCV: selecting a sled servo control with CLV lock
With SCV = "0," the sled servo is turned off (with PWM output stopped) to unlock CLV.
With SCV = "1," the sled servo is normally on, irrespective of whether or not CLV is locked.

RFP: selecting the polarity of data to an RF processor system (circuits to generate FOK, MIRR, etc.)

TFP: selecting the polarity of a tracking error zero cross (TEC) signal

FOK LEVEL:
setting a reference value in the RF detector circuit

FSPW1, FSPW0:
selecting a PWM output carrier

FSPW0: changing a motor system PWM carrier 88.2 kHz with FSPW0 = "0" and 22.05 kHz with FSPW0 = "1."

FSPW1: changing an actuator system PWM carrier 88.2 kHz with FSPW1 = "0" and 176.4 kHz with FSPW1 = "1."

T1, T0: square wave cycle upon focus search

SETTING		CYCLE
T0	T1	
0	0	approx. 0.74 sec. (2^{16}/Fs)
0	1	approx. 1.49 sec. (2^{17}/Fs)
1	0	approx. 2.97 sec. (2^{18}/Fs)
1	1	approx. 5.94 sec. (2^{19}/Fs)

20 H, 21 H:
register to set a kick level upon track jump
22 H, 23 H:
register to set a kick time upon track jump
Kick Time = (set value + 1) × 1/Fs (11.3 µs)
23H, 24H:
traverse counter setting register
25H: sled kick setting register
SLED KIK LEVEL:
sled kick level setting register
SL1, SL0:
selecting SLED FULL KICK or SHORT mode

SL1	SL0	MODE
0	1	short
1	0	full kick
0	0	normal kick

TCS: selecting the tracking zero cross comparator
TECO input, with TCS = "0" and
TEC1 input, with TCS = "1"
CV2: selecting the sensitivity of CLV error detector with speed doubled
Normal speed selected, with CV2 = "0" and
Double speed selected, with CV2 = "1"
E3EN: controlling the function of protecting EFM ≦ 3T upon high-speed access
protector off, with E3EN = "0" and Protector on, with E3EN = "1."

(5) Focus servo system

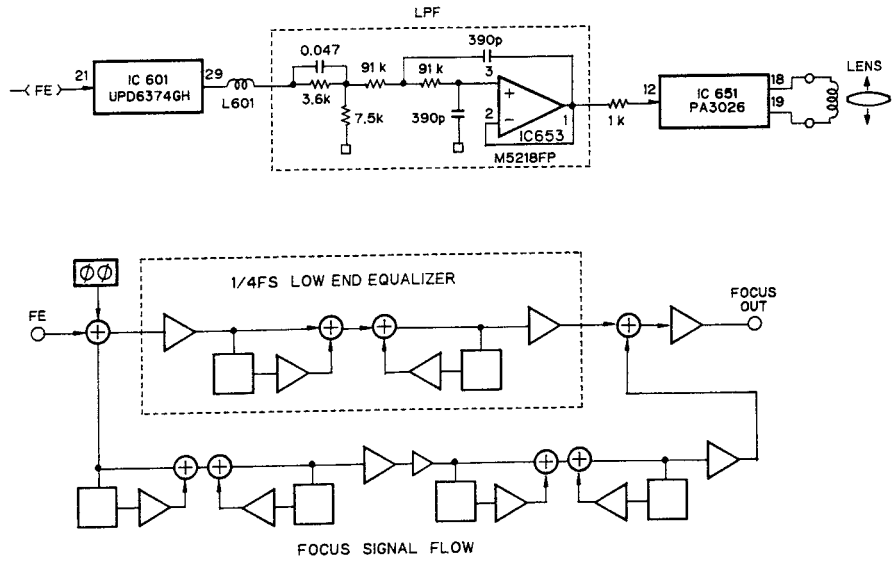


Fig. 71

The digital loop filter is built in the interior of the IC. Sending a coefficient from the microcomputer will allow you to obtain a desired equalizer curve. The present system has an equalizer curve shown in Fig. 75.

a) In-focus
In the in-focus sequence, the lens is driven into a focus S-curve (approx. 10 µm) to close the servo loop on an in-focus basis. A flow of signals in focus is shown in Fig. 72.

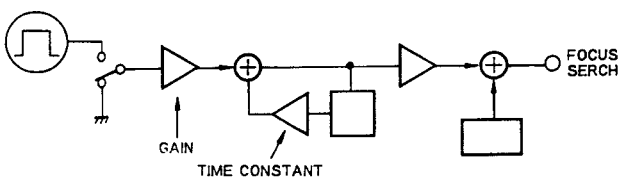


Fig. 72

The search voltage is designed to fall within a range of the lens drive distance ± 1.0 mm, being entirely dependent upon the sensitivity of a focus actuator. In the present system, both gain (voltage) and time constant are determined according to a coefficient from the microcomputer, based on the pulse in a specified cycle, which has been set in a register. The timing in which a focus is to be closed, moreover, is generated, based on the value which has been set as referred to in a signal flow shown in Fig. 73.

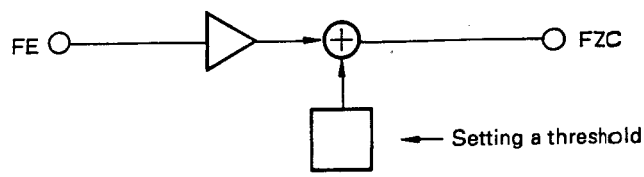


Fig. 73

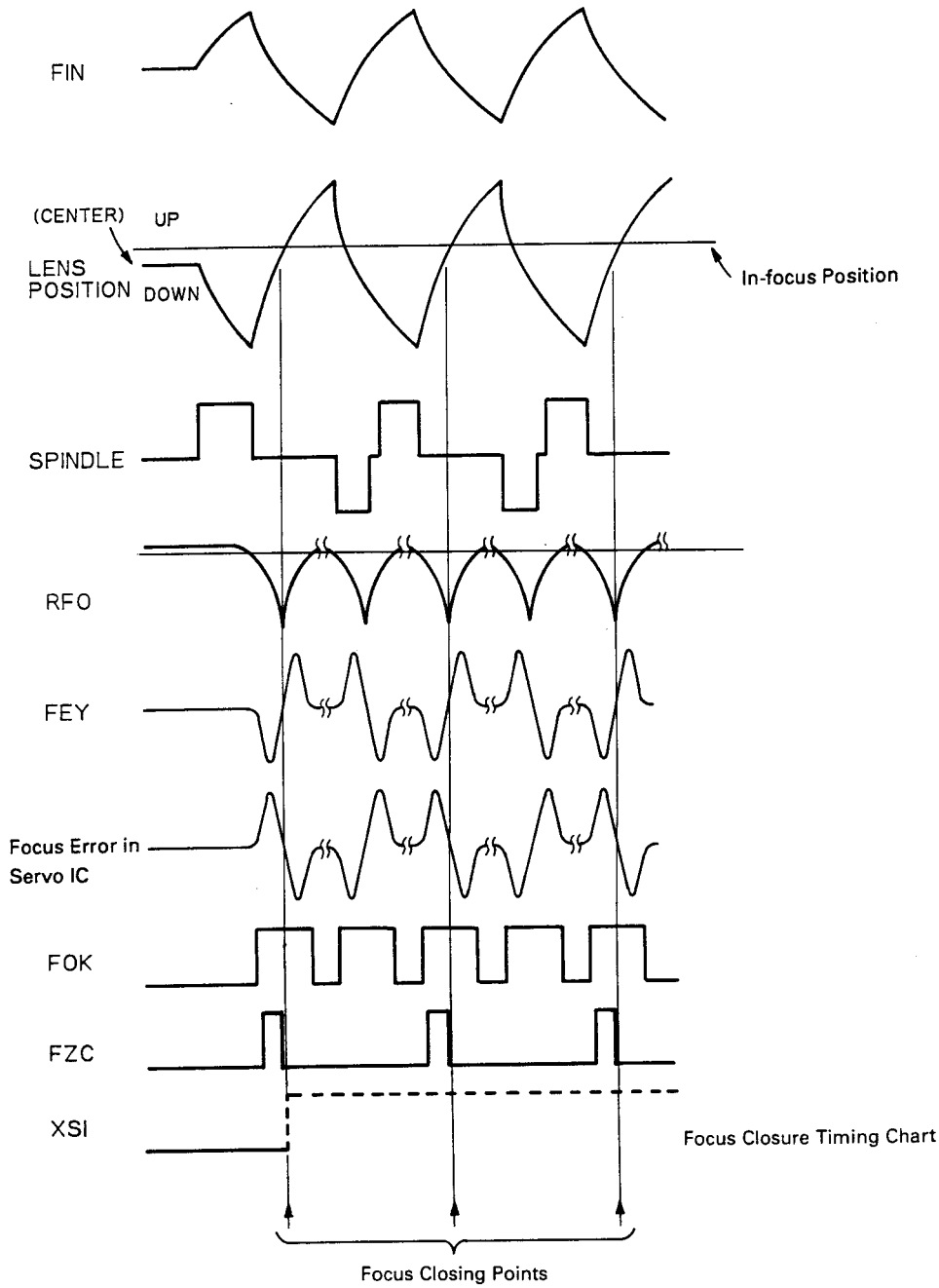

FIN
(CENTER)
UP
LENS POSITION
DOWN
In-focus Position
SPINDLE
RFO
FEY
Focus Error in Servo IC
FOK
FZC
XSI
Focus Closure Timing Chart
Focus Closing Points

Fig. 74

(6) Focus equalizer

The present system permits a specific equalizer curve to be obtained according to the coefficient sent from the microcomputer. A digital filter built in IC UPD6374GH and an active filter mounted in the exterior are used to obtain a specified equalizer curve.

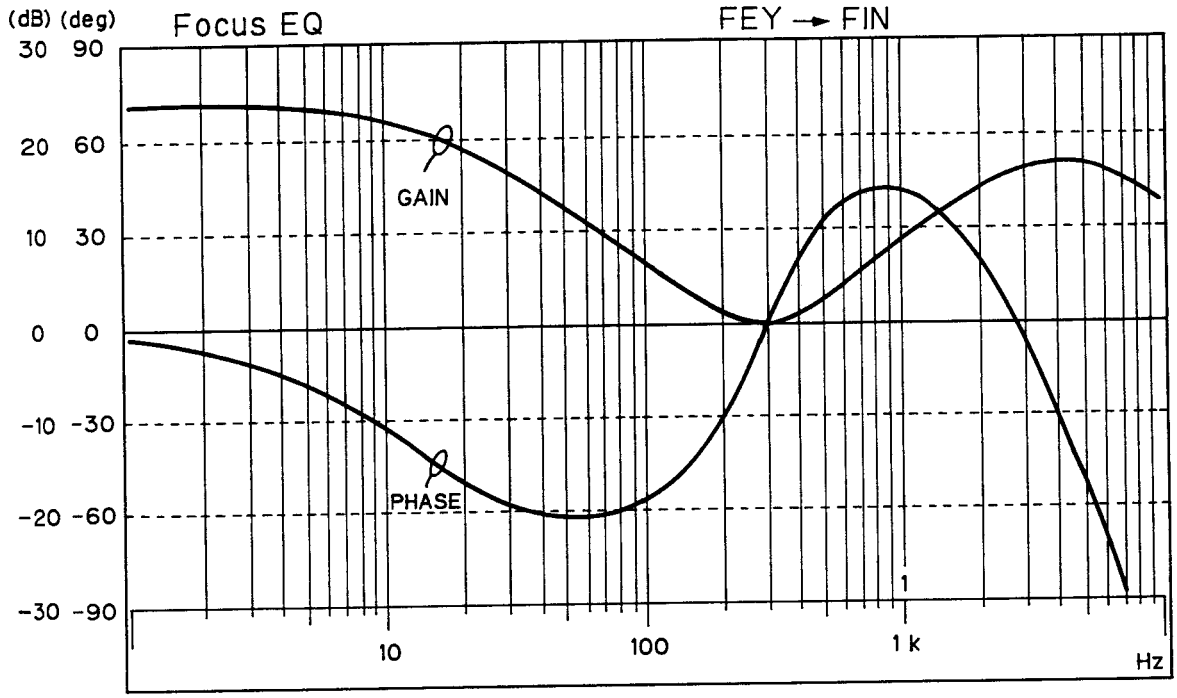


Fig. 75 Focus equalizer

(7) Tracking carriage servo system

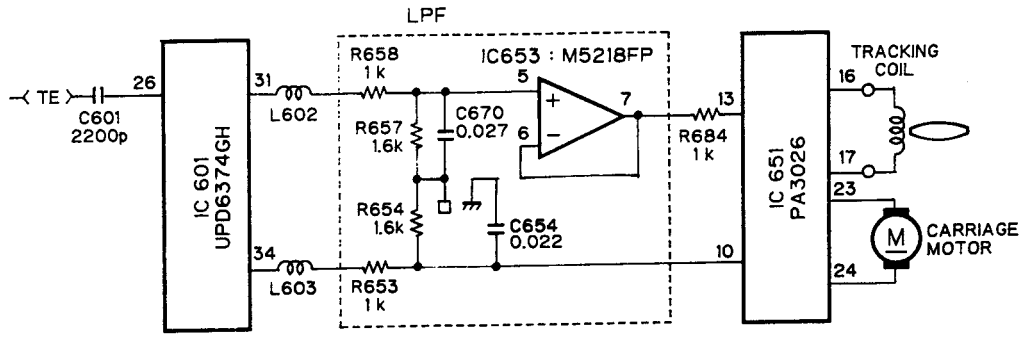


Fig. 76 Tracking carriage servo block diagram

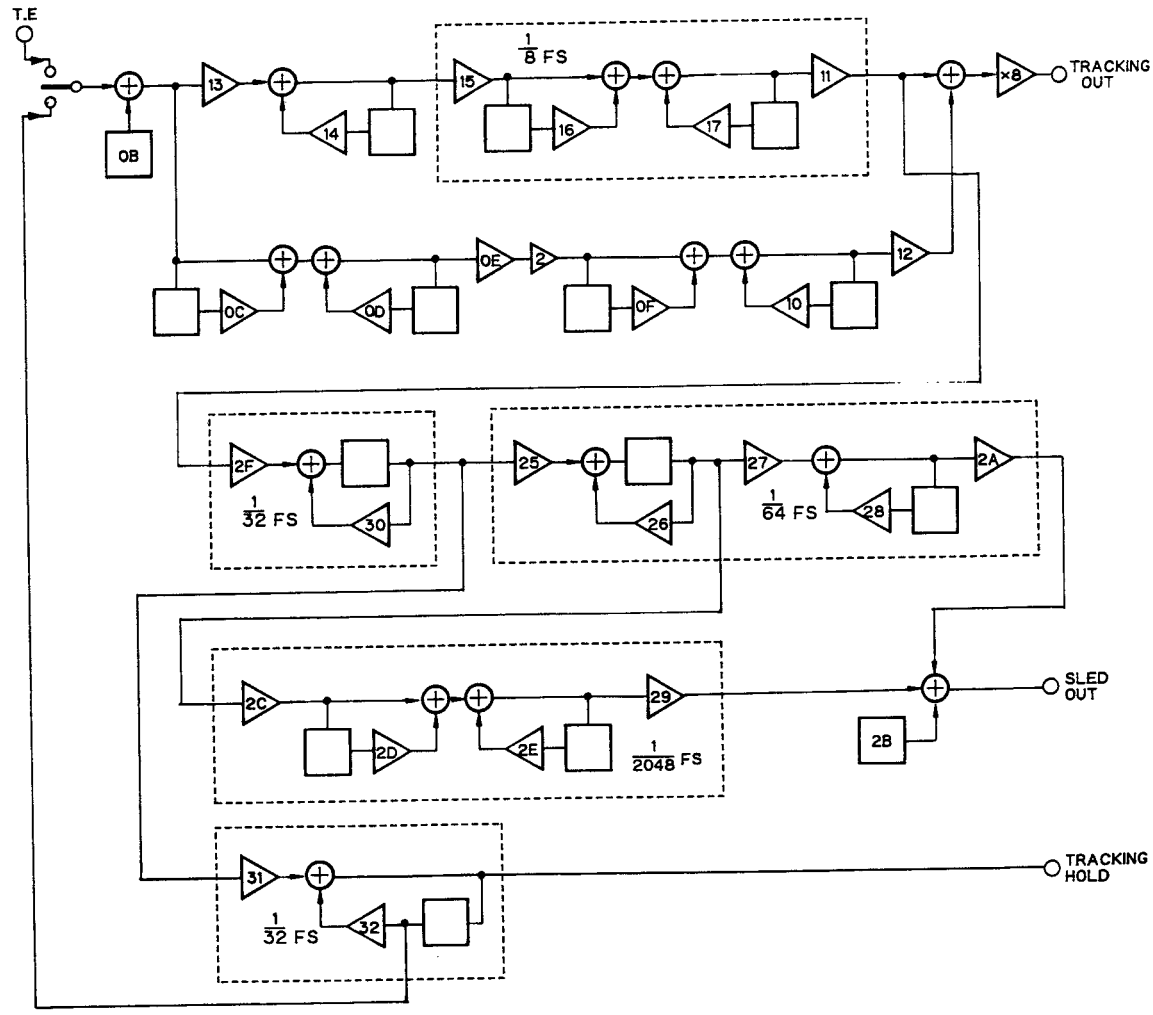


Fig. 77 Tracking carriage signal flow chart

Shown in Fig. 76, 77 are a block diagram of the tracking carriage servo system and a flow of signals in IC UPD6374GH. To make a track jump either forward or reverse, tracking kick and brake voltages and carriage kick and brake voltages are set in related registers beforehand. A jump forward or reverse is made at the voltage which has been set in an instruction from the microcomputer.

a) Traking equalizer

In the present system, a digital filter is built in IC UPD6374HG, allowing a specific equalizer curve to be obtained according to the coefficient sent from the microcomputer. And a passive filter is externally mounted. These two filters are used to obtain a specified equalizer curve. To allow a stable pull-in throughout the search, moreover, the equalizer curve applied is so set as to obtain a higher level of gain than that during the play.
Fig. 78 shows the tracking equalizer curves observed during both play and search.

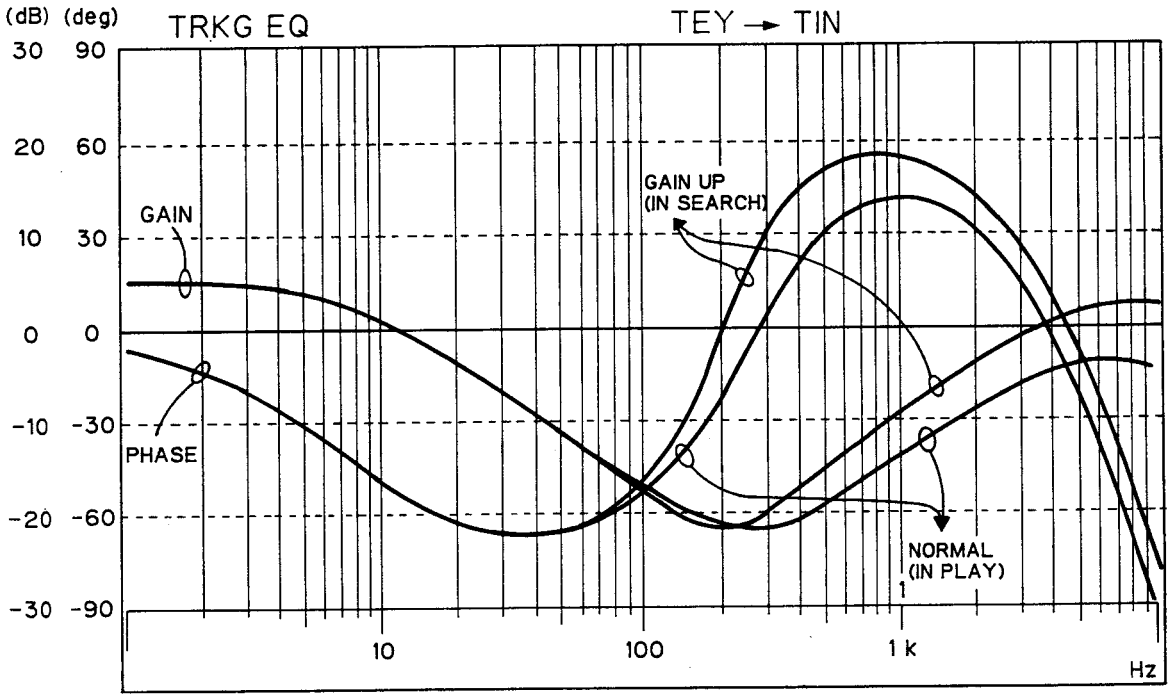


Fig. 78 Tracking equalizer

b) Brake circuit (Fig. 79)

Since the actuator is put into a non-linear status in the in-focus mode or in the track-jump mode, the pull in the servo loop turns out very poor after completion of a jump. While both pickup and disc are relatively moving, the brake circuit permits tracking to be closed smoothly. The direction in which both pickup and disc are moving is detected, based on a phase relation between MIRR and tracking error signals. With an accelerating component only cut off the tracking error, the decelerating component only is used while repeating the ON/OFF operations of servo on a chopper basis.
Thus, a stable pull in the servo loop is performed.
This circuit's ON/OFF operations are controlled by the microcomputer.

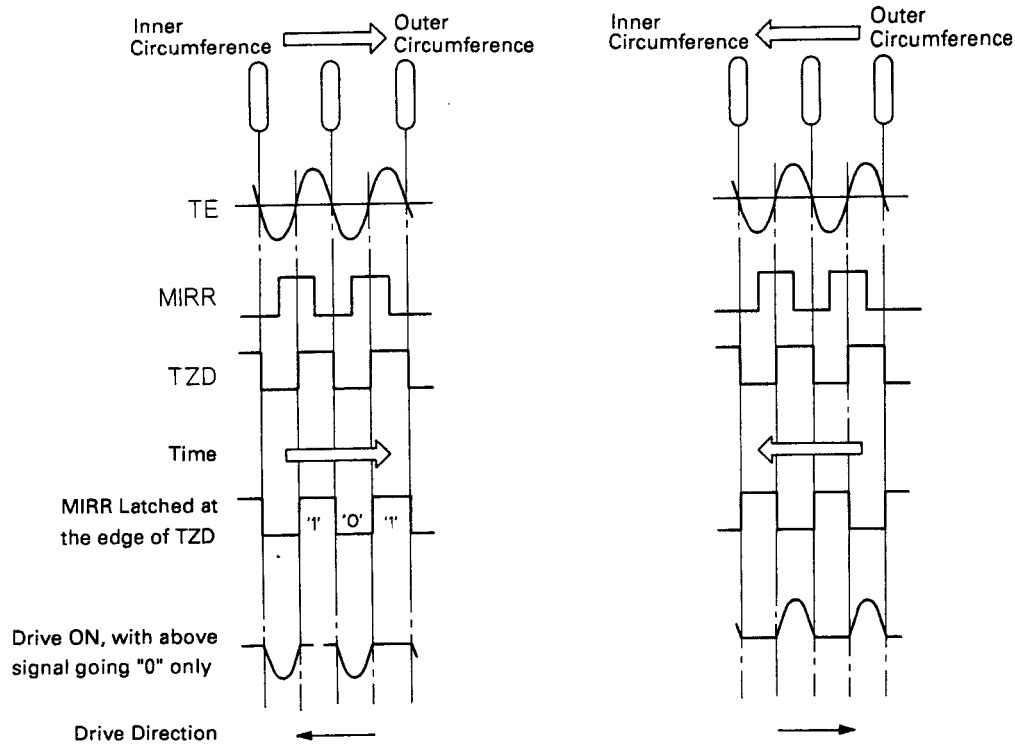


Fig. 79 Brake circuit operation

c) Carriage equalizer

As shown in the signal flow, the carriage servo system takes for an input the voltage at which the tracking actuator is driven. Based on the equalizer curves shown in Fig. 80, moreover, the system obtains those components which are required to feed the carriage. In the present system, a threshold voltage is set beforehand so as to turn on the carriage servo when the tracking actuator has a lens deflection fall outside the range of approximately 130 tracks in relation to the low-pass filter output at the tracking drive voltage.

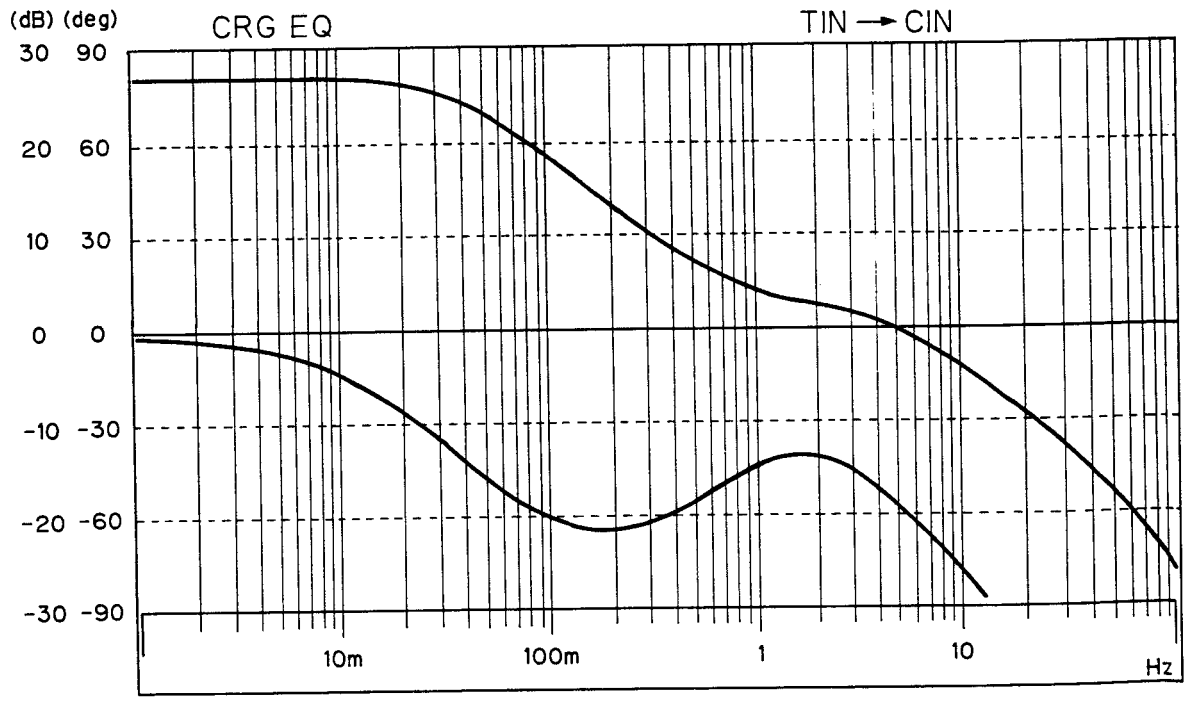


Fig. 80 Carriage equalizer

(8) Track Jump

The present system is jumping tracks 1, 10 and 32 subject to an automatic sequence of the UPD6374GH. The 64, 80 track jumps conventionally available have been substituted for 32TRK × 2 and 32TRK × 3, accordingly. Fig. 81, 82 shows a timing chart of the 1, 10 and 32 track jumps.

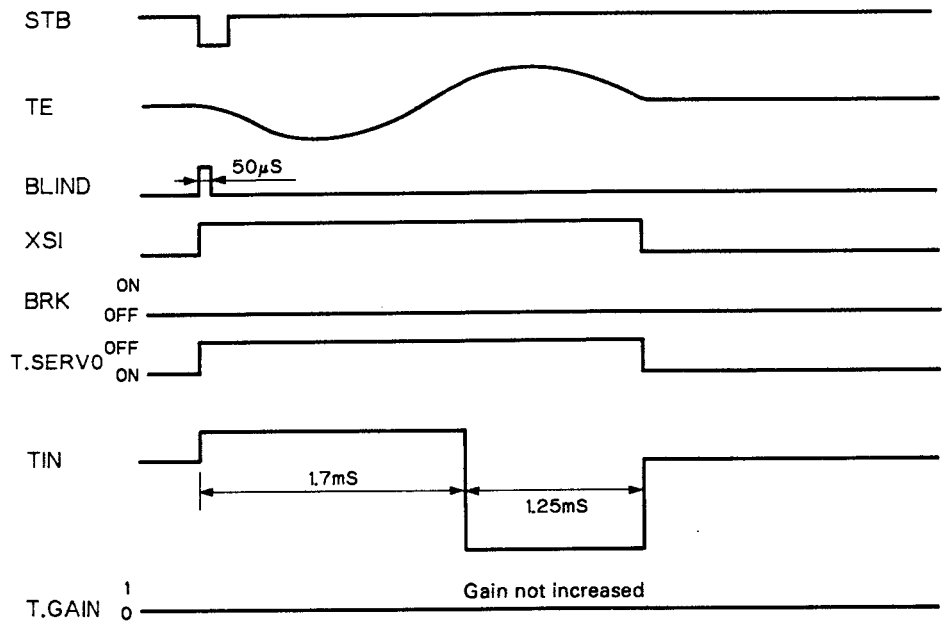


Fig.81 Single jump

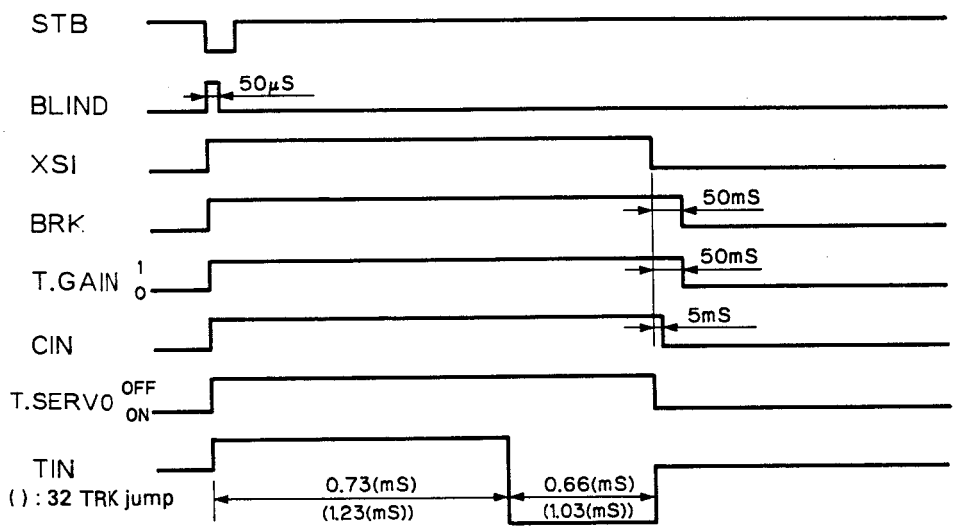
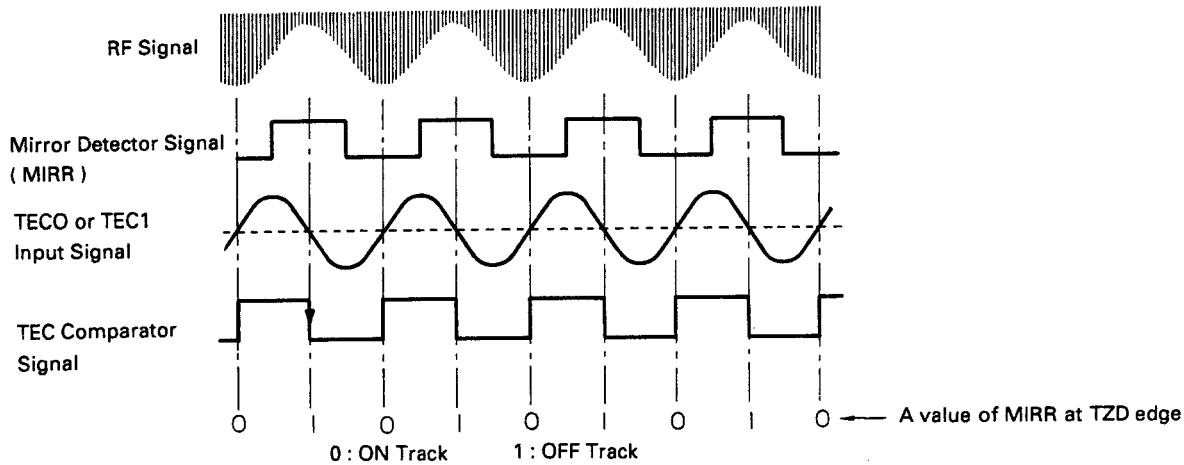


Fig.82 10/32 Track jump

a) Track jump counter

When tracks are consecutively crossed, a tracking error signal will not fail to cross the DC offset point in both on- and off-track modes as shown in Fig. 83. This point, threrfore, is used to determine either on- or off-track so as to count the number of cycles in which the on-track is switched over to the off-track. A count value is set by the microcomputer. And this count value is given priority to the kick-setting time.



The number or cycles in which 0 changes to 1 should be counted.

Fig.83 Track count jump

3. CLV Control Stage

(1) CLV control command and CLV mode command

MSB LSB

D	I	L	G	T	D2	D1	D0

D	0	RFCK/4 and WFCK/4	Select a steady servo phase comparison signal.
	1	RFCK/8 and WFCK/8	
I	0	RFCK/16	Select a bottom hold cycle of pull-in and rough servos.
	1	RFCK/32	
L	0	MDF, MDR (H, Z) outputs	Select an MDF/MDR output terminal selecting method.
	1	MDF, MDR (H, L) outputs	
G	0	−12 dB	Select the gain of pull-in and rough servos.
	1	0 dB	
T	0	RFCK/2	Select a peak hold cycle of pull-in servo.
	1	RFCK/4	

D2	D1	D0	MDF	MDR	Control Status
0	0	0	L	L	stop
0	0	1	H	L	kick
0	1	0	L	H	brake
0	1	1	L	L	stop
1	0	0	L/H	L/H	pull-in servo
1	0	1	L/H	L/H	rough servo
1	1	0	L/H	L/H	steady servo
1	1	1	L/H	L/H	applied servo

• Pull-in Servo

This servo is used to pull the spindle motor speed into a specified number of revolutions. With a cycle of 8.6436 MHz reckoned as T, we can get "22T" (synchronous signal) as the maximum inversion interval of an EFM signal at the specified number of revolutions. Therefore, determine the EFM signal's maximum inversion interval and compare it with "22T" so that we can detect whether the motor speed is higher or lower than the specified number of revolution.

EFM SIGNAL MAX. INVERSION INTERVAL	MDF TERMINAL	MDR TERMINAL	MOTOR SPEED
"21T" and below	L(Z)	H	high
"22T"	L(Z)	L(Z)	
"23T" and above	H	L(Z)	low

Z: High impidamce

• Rough Servo

This servo is used for the high-speed access in which the carriage is moved at a high speed, with focus servo ON and tracking servo OFF.

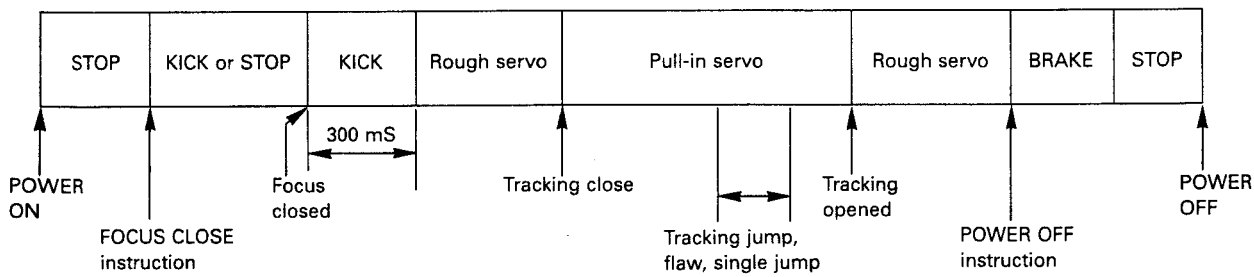
• Steady Servo

This servo is used to maintain the spindle motor speed at a specified number of revolutions.
It is outputted as a result of comparing the phase between WFCK/4 and RFCK/4 or between WFCK/8 and RFCK/8.

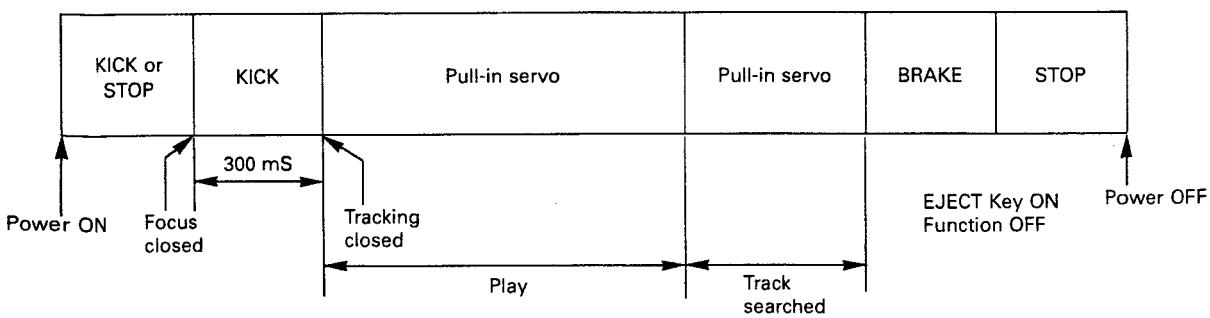
• Application Servo

This is the CLV servo mode available during the normal operation. In the EFM demodulator block, every WFCK/16 is sampled to determine whether or not the frame synchronizing signal coincides with an output of the internal frame counter. As a result, a signal is generated to show whether or not they are coincident. Once this signal has been found not incident in eight consecutive cycles, the status is first determined asynchronous. Under any other conditions, the status is deemed synchronous. The CLV application servo mode automatically selects the pull-in servo in the asynchronous status and the steady servo in the synchronous status. This feature is not employed in the present system.

• Test Mode



• Normal Mode



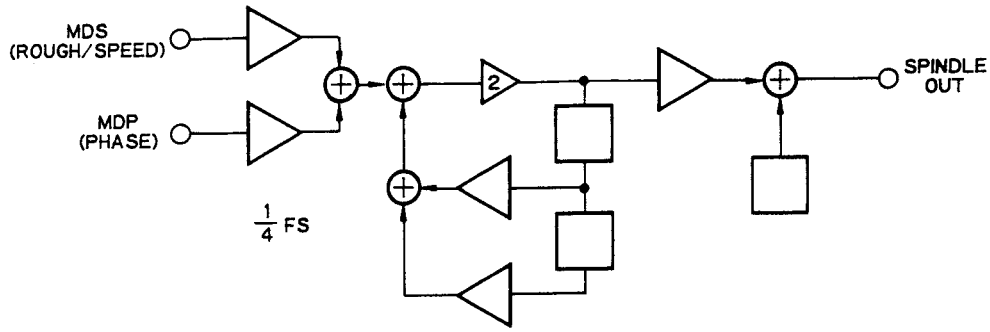


Fig.84 Spindle signal flow chart

(2) PLL stage

The present system employs a digital PLL circuit illustrated below. This PLL circuit operates so as to lock the rising edge of a PLCK and the edge of an EFM signal. And it has a resolution of as high as approximately eight times IT (T = EFM signal's bit rate = 1/4.3218 MHz). Both frequency divider output frequency and EFM bit rate have their errors automatically regulated to adjust the mean free-run frequency to the bit rate.

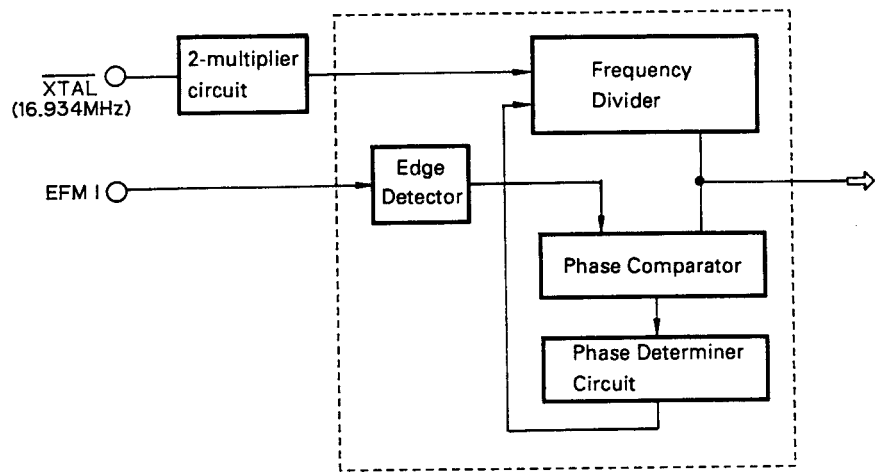


Fig.85 Digital PLL block diagram

4. Power Supply Stage

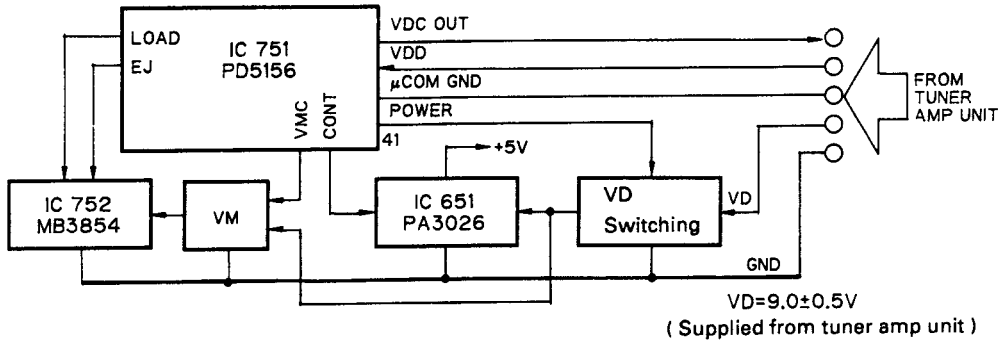


Fig. 86

Fig. 86 shows the block diagram of the power supply unit in the present system.
The present system generates +5 V and loading power supplies, based on the VD (VDD is a power supply for the microcomputer's exclusive use, which is supplied from the product.

1) +5 V System
The +5 V system, which supplies power to CD LSI, is generated by a regulator in IC651. The ON/OFF operations of the +5 V system are controlled through the "POWER" (Pin ㊶ on IC751) in the VD switching unit.

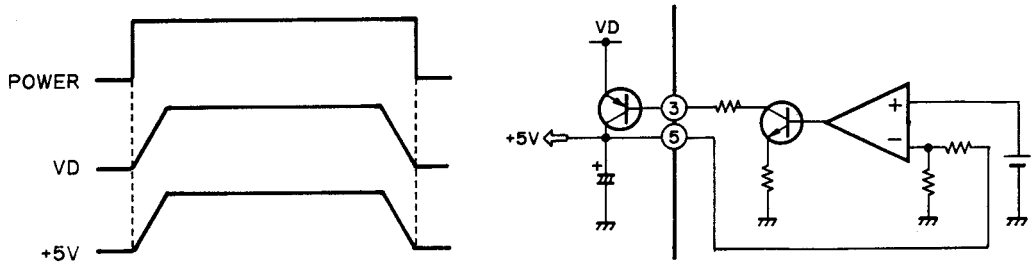


Fig. 87

2) Loading System
A stabilized power supply of approximately 5.4 (V) is provided to supply power to the loading motor drive LSI (VM). It is controlled through the VMC.

5. Indicating an Error Number

If the CD should fail to operate in either single or multi mode, or if an error has taken place during the operation and resulted in an error, the player will enter into the error mode. And the cause of such error is numerically indicated.
This is aimed at assisting an analysis or a repair.

(1) Basic Means of Display

- With ERROR indicated in "MODE" on P-BUS Display date, an error code is transmitte by the use of MIN and SEC.
  Identical date are transmitted with MIN and SEC.
- Examples of Head Unit Display
  E-XX (4 digits)
  Err-XX (6 digits)
  ERR-XX (6 digits)
  ERROR-XX (8 digits)

(2) Number of Error Codes

100 codes, randing from 00 thut 99; a litte more extensible if "A" and "L" are used.

(3) Error Codes

Error Code	Classification	Mode	Description	Detail/Cause
10	ELECTRIC	SET UP	Carriage home failure	Unmovable to and from the inner circumference → Home switch failed and/or carriage improper moved
11	↑	↑	Focus failure	Focussing failed → Disk scarred or stained on the back or vibrating hard
12	↑	↑	SET UP failure	Spindle failed to lock or subcode extraordinary → Spindle defective, disk other than audio and ROM
30	↑	SEARCH	Search time out	Target address failed to reach → Carriade/tracking improperly and/or disk scarred
A0	SYSTEM	—	Power failure	Power overvoltage or short circuit detected → Switching transistor defective and/or power abnormal

*In the CD single mode, no error is indicated with the mechanism separately.
If TOC has failed to be read in, the operation will continue anyway.
Error Code A0 is peculiar to the this unit and inapplicable to another future CD player.

6. New Test Mode (aging operation and setup analysis)

The CD, either single or multiple, plays in the normal mode. After being set up, it will display FOK (focus), LOCK (spindle), subcode, sound skip, protection against a mechanical error or the like, occurrence of an error, cause and time of an expiry, if any, (and disc number in the multi-mode).
During the setup, the CD software operation status (internal RAM and C-point) is displayed.
The software on the head unit side does not involve any special problem but runs normally.

(1) How to Put in the NEW TEST Mode
See the test mode flow chart page21.
(2) Relations of keys between TEST and NEW TEST Modes.

P-BUS Commands	Keys	Test Mode Regulator OFF	Regulator ON	New Test Mode Play in progress	New Test Mode Error / Protection] Talking place
B0	CLR/BAND	Regulator ON	Regulator OFF	(REL/CLR)	Time of occurrence / Cause of error] Selected
B1	TRACK+	—	FWD-KICK	TRACK+	—
B2	TRACK−	—	REV-KICK	TRACK−	—
B3	F · 1	—	TRACKING CLOSE	F · 1	—
B4	F · 3	—	TRACKING OPEN	F · 3	—
B5	F · 2	—	FOCUS CLOSE	F · 2	—
B6	—	—	FOCUS OPEN	—	—
B7	—	—	Jump-OFF	—	—
B8	TRACK+ / TRACK−	To new Test Mode	Jump-Mode selected	TRACK+ / TRACK−	Occurrence TNo / Time of occurrence] Selected

Operations, such as EJECT, CD ON/OFF, etc. are to be performed normally

(3) Error Cause (Error Number) Code

Error Code	Classification	Mode	Description	Cause/Detail
40	ELECTRIC	PLAY	FOK = L 100 ms	Put out of focus
41	↑	↑	LOCK = L 100 ms	Spindle unlocked
42	↑	↑	Subcode unacceptable 500 ms	Subcode failes to read
43	↑	↑	Sound skipped	Last address memory operated

Scar, Stain, Vibration, Servo defect, etc...

*With CD single, no mechanical error is displayed while aging. The error code is identical with those in the normal mode.

(4) Indicating an Operation Status During Setup

Status No.	Description	Protection operation
01	Carriage home mode started	None
02	Carriage moving on the internal circumference	10-second time out
03	Carriage moving on the external circumference	10-second time out
11	Setup started	None
12	Spindle turn/Focus search started	None
13	Waiting for focus closing	Failure to focus closing
14	Spindle kicked and focus checked	Out of focus
15	Tracking closed and focus checked	Out of focus
17	Carriage closed and focus checked	Out of focus
18	Lock, subcode] Waiting	Failure to lock, Subcode failed to read out of focus
19	End	None

(5) Example of 7-segment Display

(a) SET UP in progress

TRACK MIN SEC 11 11 11 TRACK 11 MIN SEC 11 11	While in the TEST MODE, a status number is indicated in TNO, MIN and SEC.

(b) Operation (PLAY, SEARCH, etc.) in progress Perfectly identical with that in the multi mode.

(c) Protection/Error upon occurrence

ERROR-XX Err-XX, ERR-XX E-XX	While in the error mode, an error number is displayed in MIN and SEC.

Select the display with the CLR/BAND key.

TRACK MIN SEC 10 40 05 TRACK 10 MIN SEC 40 05	While in the PLAY MODE, an adsolute time is indicated in TNO, MIN and SEC.

Select the display with the TRACK+ and TRACK− key.

17. MECHANISM DESCRIPTION

• Disc Loading

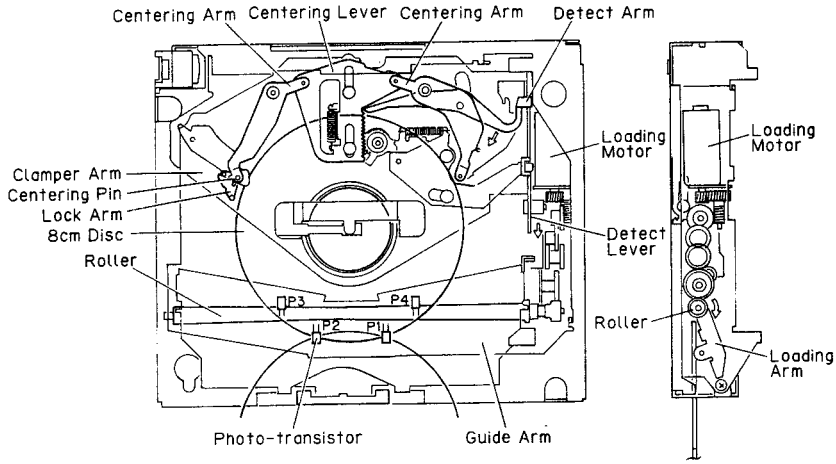


Fig. 88

1. There are four photo transistors on the front and back of the rubber roller that convey the disc, and four corresponding LEDs which light. (The LEDs light when the photo transistor voltage is L.
2. When the disc is inserted to the point in front of the rubber rollers, a H voltage is recorded on the photo transistors in the front section (P1, 2) and the loading motor starts.

3. The motor drive is transmitted via the gears, the rubber rollers revolve and the disc is conveyed.
   The rubber rollers are held on the tip of the loading arm by the strength of the loading arm spring, and the guide arm is in the raised position. This gives the guide arm and rubber roller a suitable adhesive strength to push forward the disc which is positioned between them.

4. The clamper arm distinguishes the size of the disc and has a centering function mechanism which clamps the disc in the center of a spindle motor.
   The centering arm operates as a single unit with the centering lever on top of the clamper arm, to keep the fulcrum movement centered.
   Centering pins and lock arms are attached to the tips of the centering arm. Centering pins are positioned so that when an 8cm disc is placed on the spindle the external edge touches the pins. Lock arms revolve around centering pins. When an 8cm disc is mounted it is locked in place by the clamper arms. When a 12cm disc is mounted, the lock is released and moves according to the broken line in Fig. 89.
   The position of the detect arm which is mounted on the centering arm at the bottom right of the figure differs for 8cm and 12cm discs. When a disc is placed on the spindle the detect lever, which moves in a clockwise direction on the outside edge, moves to the lower section of the figure.

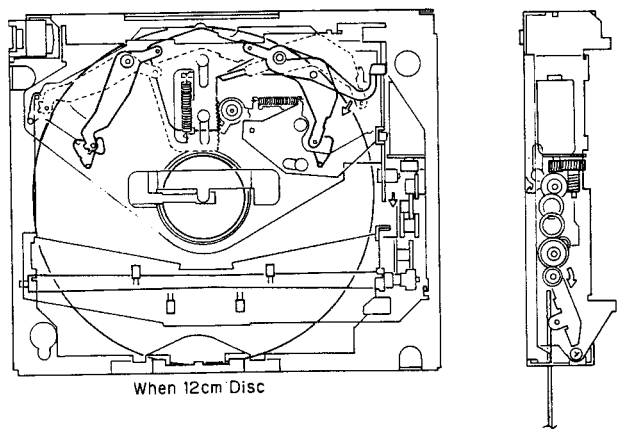


Fig. 89

• Clamping

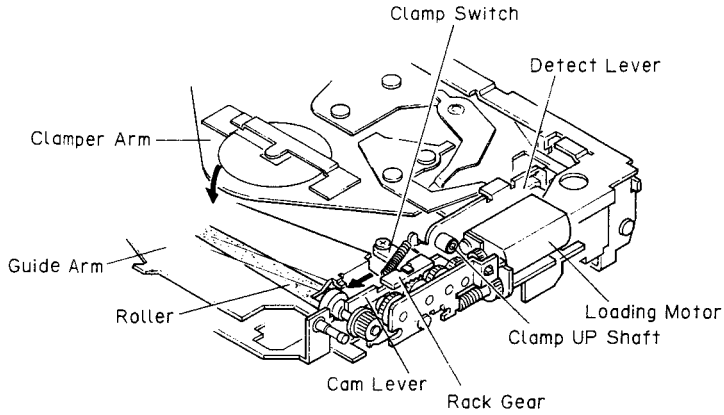


Fig. 90

1. Rack gear that comes into contact with the detect lever, in combination with the gears that are shifted by the loading motor, move the cam lever in the direction of the arrow. Also, the rubber rollers are pushed down by the tapered section on the tips of the cam lever, and move away from the disc. When the clamp switch is switched to ON position by the rack gear arm, loading is terminated.

• Mechanism Lock

1. In the eject condition two lock arms are positioned in the front frame hole and the front side of the floating section is locked in both vertical and horizontal directions. In line with the movement of the cam lever, the L arm moves the rotating mechanical locking lever to the left.
   The mechanical lock arms L and R move in the directions designated by the arrows and the floating section is released from the frame.

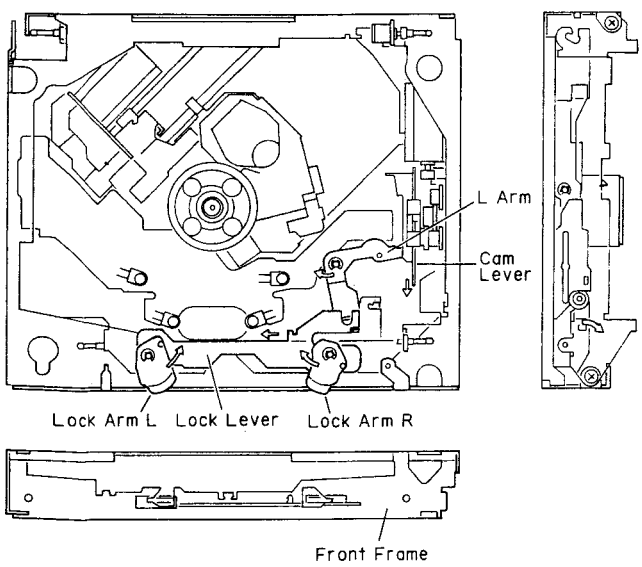


Fig. 91

- **Eject**

1. The eject mechanism operates by reversing the rotation which takes place when the loading motor loads. The cam lever moves and operates the mechanical lock, the clamp is released, the roller is applied, and the disc is conveyed. In the case of a 12cm disc the loading motor stops at the position at which the photo transistor lights at the rear of the rubber roller section. However, in the case of an 8cm disc motor revolution stops after a fixed period of time. In this process the disc type is recognized during the play function, by the voltage of the photo transistor (P1, 2) located in front of the rubber rollers.